FINAL

RUNWAY 4-22
ALTERNATIVES ANALYSIS

Prepared for

EASTON/NEWNAM FIELD
EASTON, MD

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1.0 PROJECT BACKGROUND

The most recent Airport Layout Plan (ALP) Update for Easton/Newnam Field (ESN) was prepared by Delta Airport Consultants in August 2006. The primary recommendation of this ALP Update was to convert Runway 15-33 to the Airport's primary runway and extend it to the length necessary to serve the Airport's critical aircraft. The critical aircraft is defined as the aircraft or family of aircraft with the largest wingspan and highest approach to landing speed that uses the airport on a regular basis. A runway length analysis was completed as part of the ALP Update to determine the runway length needed to accommodate the critical aircraft's takeoff requirements. The results of this analysis showed that the Hawker 800, the aircraft identified as the critical aircraft for runway length consideration, requires 6,900 feet of runway. Although the full recommended length for Runway 15-33 to meet the needs of the Hawker 800 was determined to be 6,900 feet, this length was deemed unattainable due to the potential impacts to wetlands, biotic communities, and Delmarva Fox Squirrel (DFS) habitat and therefore, decreased to 6,200 feet. The ALP Update also states that if the Environmental Assessment (EA) findings indicate a length greater than 6,200 feet to be feasible, it is recommended that Talbot County (the County) pursue the additional length up to 6,900 feet.

As a result of the ALP Update, a Scope of Work was prepared by URS for an EA for the Five-Year Capital Improvement Program (CIP), which included the extension and conversion of Runway 15-33 to the primary runway at ESN. The original Scope of Work for the EA was finalized on June 19, 2006, and a Notice-to-Proceed was issued on August 7, 2006. An Agency Scoping Meeting and a Public Scoping Workshop were held on February 20, 2007. At this meeting, the Eastern Shore Land Conservancy expressed their opposition to the project since they, along with Maryland Environmental Trust as co-grantee, hold a conservation easement on the property previously owned by Mary and Charlotte Fletcher. This property was designated for acquisition on the ALP approved by the Federal Aviation Administration (FAA) in August 2006 (which was the basis on which the final EA Scope of Work was prepared) in order to accommodate the extension of Runway 15-33 to the northwest as depicted on the approved ALP. Subsequent meetings with the Talbot County Council, Eastern Shore Land Conservancy, Attorney General, Maryland Environmental Trust, as well as the advice of legal counsel, resulted in a decision by the County to no longer pursue any future plans for Airport expansion onto the Fletcher property.

As a result, additional planning services were required to revisit alternatives involving an extension to Runway 4-22, which were initially evaluated in the Runway Safety Area Study completed by Delta Airport Consultants in 2003. Subsequently, because alternatives involving an extension to Runway 4-22 are being re-developed, the potential to increase the runway length closer to the 2006 ALP Update's original runway length objective of 6,900 feet is being revisited.

2.0 RUNWAY 4-22 AIRPORT DESIGN CRITERIA

Airport design criteria must be identified and applied, to properly and consistently plan future airport facilities. Airport design criteria are specified by the Airport Reference Code (ARC). The ARC is a

coding system used to relate airport design criteria to the operational and physical characteristics of the airplanes intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the aircraft approach category which relates to aircraft approach speed and provides information on the operational capabilities of aircraft. The second component, depicted by a Roman numeral, is the airplane design group and relates to airplane wingspan or tailheight, whichever is the most restrictive and provides information regarding the physical characteristics of aircraft using the airport. **Table 2.0-1** provides a listing of the approach categories and design groups.

TABLE 2.0-1
AIRPORT DESIGN CRITERIA

Aircraft Approach Category		
Category	Approach Speed (kts)	
A	Less than 91	
B	91 or more but less than 121	
C	121 or more but less than 141	
D	141 or more but less than 166	
E	166 or more	
Airplane Design Group		
Group	Wing Span (ft)	Tail Height (ft)
I	‹ 49	‹ 20
II	49 - ‹ 79	20 - ‹ 30
III	79 - ‹ 118	30 - ‹ 45
IV	118 - ‹ 171	45 - ‹ 60
V	171 - ‹ 214	60 - ‹ 66
VI	214 - ‹ 262	66 - ‹ 80

Source: AC 150/5300-13 Change 13, *Airport Design*

2.1 AIRCRAFT APPROACH CATEGORY

A review of aircraft presently using, and forecasted to use ESN, reveals that the aircraft in Approach Category D regularly use the Airport. This includes the Gulfstream IV and a few other business jets. Approach Category D will be used to plan future airfield facilities associated with Runway 4-22.

2.2 AIRPLANE DESIGN GROUP

The critical aircraft based on Airplane Design Group at ESN was determined to be the Gulfstream IV for Runway 4-22. The Gulfstream IV, which is the largest aircraft anticipated to use ESN on a regular basis, has a wingspan of approximately 78 feet which places it in Airplane Design Group II.

2.3 AIRPORT REFERENCE CODE

The ARC is determined by combining the Aircraft Approach Category letter with the Airplane Design Group number. Consequently, the ARC for Runway 4-22 is D-II.

2.4 RUNWAY SAFETY AREAS

Runway Safety Areas (RSA) are defined by the FAA as "a defined surface surrounding the runway that are prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." RSAs consist of a relatively flat graded area that is free of objects and vegetation that could damage aircraft. According to FAA guidance, the RSA should be capable, under dry conditions, of supporting aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft. **Table 2.4-1** presents the FAA standard RSA dimensions for runway serving aircraft in approach categories D-II.

TABLE 2.4-1
FAA DIMENSION STANDARDS (FUTURE ARC D-II RUNWAY)

		FAA Standard		
	Runway	**Length (Feet)**	**Width (Feet Centered on Runway Centerline)**	
RSA	4	1,000	500	
	22	1,000	500	
OFA	4	1,000	800	
	22	1,000	800	
RPZ	4	2,500	1,000 Inner Portion	1,750 Outer Portion
	22	1,700	500 Inner Portion	1,010 Outer Portion

Source: AC 150/5300-13 Change 13, *Airport Design*

2.5 RUNWAY OBJECT FREE AREA

In addition to the RSA, the Object Free Area (OFA) is also defined around runways to enhance the safety of aircraft operations. The FAA defines the OFA as an area clear of above ground objects protruding above the RSA edge elevation. Unlike the RSA, there is no physical component to the OFA. Thus, there is no requirement to support an aircraft or emergency response vehicles. **Table 2.4-1** summarizes the OFA dimensions.

2.6 RUNWAY PROTECTION ZONE

The purpose of Runway Protection Zone (RPZ) is to enhance the protection of people and property on the ground. These areas should be cleared of incompatible objects and activities. The dimensions of the RPZ for a particular runway end are a function of the type of aircraft and approach

visibility minimum associated with that runway end. It is centered on the extended runway centerline and begins 200 feet beyond the end of usable pavement. The RPZ for a runway with approach visibilities not lower than ¾ mile, such as existing Runway 4, is 1,700 feet long, with an inner width of 1,000 feet and an outer width of 1,510 feet. This creates a trapezoidal shape that encompasses 48.9 acres. For a runway with approach minimums lower than ¾ mile, such as the future Runway 4, the associated RPZ is 2,500 long, has an inner width of 1,000 feet and an outer width of 1,750 feet encompassing 78.9 acres. **Table 2.4-1** shows the RPZ dimensions for future Runway 4-22.

2.7 RUNWAY DESIGN COMPONENTS

2.7.1 DECLARED DISTANCES

Declared distances are usually used on runways where it is impracticable to provide a full RSA, OFA, or RPZ in accordance with FAA design standards in Advisory Circular (AC) 150/5300-13 Change 13, *Airport Design*. Declared distances are defined as the distances the airport owner declares available and suitable for satisfying an airplane's take-off distance, accelerated-stop distance, and landing distance requirements. These distances are defined as:

Take-off run available (TORA): The runway length available and suitable for the ground run of an airplane taking off.

Take-off distance available (TODA): The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.

Accelerate-stop distance available (ASDA): The runway plus stopway length declared available and suitable for the acceleration and deceleration of an airplane aborting take-off.

Landing distance available (LDA): The runway length declared available and suitable for a landing airplane.

2.7.2 *ENGINEERED MATERIALS ARRESTING SYSTEMS*

A standard Engineered Materials Arresting System (EMAS) provides a level of safety that is generally equivalent to a full RSA built to the dimensional standards in AC 150/5300-13 Change 13. It is a bed of lightweight, crushable concrete at the end of a runway and is designed to minimize the potential for structural damage to aircraft. An EMAS is located beyond the end of the runway and centered on the extended runway centerline. The minimum width of the EMAS must be the width of the runway. It usually begins at a setback distance from the end of the runway to avoid damage due to jet blast and undershoots. This distance will vary depending on the available area and the EMAS materials. EMAS installation can vary in length due to the different types of critical aircraft encountered at airports. If the alternative that is selected utilizes EMAS, specific design efforts must be accomplished to determine the dimensions needed to serve the critical aircraft at ESN.

3.0 EXISTING CONDITIONS FOR RUNWAY 4-22

Currently, Runway 4-22 is 5,500 feet long by 100 feet wide with a precision instrument approach to Runway 4 and a non-precision instrument approach to Runway 22. It is designed to accommodate ARC D-II. **Exhibit 3-1** depicts the existing conditions for Runway 4-22 at ESN.

The RSA, OFA, and RPZ associated with Runway 4 all meet FAA standards as shown in **Table 2.4-1**. The RSA, OFA, and RPZ, on the Runway 22 end do not meet FAA standards as published in AC 150/5300-13 Change 13. The RSA for the Runway 22 end currently does not meet FAA standards due to the location of the fence along Centreville Road. At a point approximately 600 feet beyond the Runway 22 displaced threshold, the Airport security fence intersects the southeast side of the extended RSA. The OFA for Runway 22 does not meet FAA standards due to Centreville Road and is currently 800 feet wide by 350 feet beyond the Runway 22 end displaced threshold. The RPZ is not clear of prohibited and/or discouraged land uses. There are small businesses, a car dealership, residential areas, Centreville Road, U.S. Route 50, and Airport Drive within the RPZ. The current conditions for Runway 4-22 are summarized in **Table 3.0-1**.

TABLE 3.0-1
CURRENT RUNWAY 4-22 CONDITIONS

	Runway 4	Runway 22
RSA	500’ wide, 1,000’ beyond runway end	500’ wide, 600’ beyond runway end
OFA	800’ wide, 1,000’ beyond runway end	800’ wide, 350 beyond runway end
RPZ	1,700 long, 1,000’ wide inner portion, 1,510 wide outer portion, encompassing 48.9 acres	1,700’ long, 500’ wide inner portion, 1,010’ wide outer portion, encompassing 29.4 acres
14 CFR Part 77 Approach Surface	50:1 slope for inner 10,000’, 40:1 slope for additional 40,000’	34:1 slope for 10,000’
14 CFR Part 77 Primary Surface	1,000’ wide, extends 200’ off end of usable pavement	

Source: ALP, Revision 1, May 2007

4.0 RUNWAY EXTENSION ALTERNATIVES

4.0.1 ASSUMPTIONS

Before developing alternatives for an extension of Runway 4-22, several limiting assumptions were made. These assumptions are listed below.

- Neither Centreville Road nor U.S. Route 50 will be closed or relocated;
- Runway 4 RPZ will not extend into the businesses on the south side of Glebe Road;

- A CAT I Precision Approach with a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) will be installed on Runway 4;
- The critical aircraft for airfield geometry will remain a Gulfstream IV (ARC D-II);
- The building currently occupied by SFA (former Black and Decker buildings) will be acquired for the Runway 4 RPZ; and
- The length of usable pavement will not exceed 6,900', as calculated in the 2006 ALP Update.

Six alternatives were developed including options with and without the use of declared distances, and the installation of EMAS. The limiting factors in all of the alternatives are the Glebe Road businesses to the south of the Runway 4 end, and Centreville Road and U.S. Route 50 to the north of the Runway 22 end.

All alternatives were developed to meet ARC D-II standards. ARC D-II includes aircraft with wingspans 49 feet up to but not including 79 feet and tail heights from 20 feet up to but not including 30 feet.

4.1 ALTERNATIVE 1 – 5,600' RUNWAY

Alternative 1 provides a 5,600 foot runway without the use of declared distances as depicted in **Exhibit 4-1**. The Runway 4 end, which is extended 1,100 feet, requires a precision RPZ that extends to the south side of the Glebe Road right-of-way. This is the farthest the Runway 4 end RPZ can be extended without requiring the acquisition of business properties located just to the south of Glebe Road because of the associated RPZ. The Runway 22 end is relocated 1,000 feet in order to achieve the required 1,000 foot RSA, and thus avoiding Centreville Road. The RSA, OFA, and RPZ for this alternative meet all FAA design criteria. The RPZ on the Runway 22 end encompasses only two small areas that are currently not controlled by the Airport, including areas of small businesses and a car dealership.

4.2 ALTERNATIVE 2 – 6,400' RUNWAY – DECLARED DISTANCES ON RUNWAY 4 END

Alternative 2 provides a 6,400 foot runway through the use of declared distances on the Runway 4 end. The Runway 4 end is extended 1,896 feet, with an 800 foot displaced threshold. The 1,100 feet of pavement before the displaced threshold will be available for use during takeoff. The Runway 22 end is relocated 1,000 feet in order to create a 1,000 foot RSA off the Runway 22 end. Through the use of declared distances, 6,400 feet will be available for takeoff on Runway 4 and 22, 6,400 feet will be available for landing on Runway 22, and 5,600 feet will be available for landing on Runway 4, as shown in the table in **Exhibit 4-2.** The RSA, OFA, and RPZ for both runways ends meet FAA design criteria. The RPZ on the Runway 22 end encompasses only small areas that are not controlled by the Airport, including areas of small businesses and a car dealership.

4.3 ALTERNATIVE 3 – 6,000' RUNWAY – EMAS ON RUNWAY 22 END

Alternative 3 provides a 6,000 foot runway without the use of declared distances and incorporates an EMAS on the Runway 22 end as shown in **Exhibit 4-3**. The Runway 4 end is extended 1,100 feet which allows for a standard RSA, OFA, and RPZ. Installing EMAS on the Runway 22 end requires the threshold to be displaced only 600 feet compared to the 1,000 foot displacement in Alternatives 1 and 2. The RSA and OFA extend 600 feet off the Runway end, which meets the FAA's requirement when EMAS is installed. The RPZ on the Runway 22 end encompasses small areas that are not controlled by the Airport, including areas of small businesses and a car dealership.

4.4 ALTERNATIVE 4 – 6,800' RUNWAY – DECLARED DISTANCES ON BOTH RUNWAY ENDS

As **Exhibit 4-4** demonstrates, this alternative creates a 6,800 foot runway through the use of declared distances on both runway ends. The Runway 4 end is extended 1,100 feet and an additional 800 feet of pavement is added for use during takeoff. The Runway 22 end is relocated 1,000 feet. Through the use of declared distances, 6,400 feet of usable pavement is available for takeoff on Runway 4 and 6,800 feet of usable pavement for takeoff on Runway 22. The use of declared distances allow for 5,600 feet of landing distance available on Runway 4 and 6,800 feet of landing distance available on Runway 22. The Runway 4 end and the Runway 22 end both have a standard RSA, OFA, and RPZ. The RPZ on the Runway 22 end encompasses small areas that are not controlled by the Airport, including areas of small businesses and a car dealership.

4.5 ALTERNATIVE 5 – 6,492' RUNWAY – MAXIMIZING LENGTH THROUGH DECLARED DISTANCES

This alternative involves the extension of the Runway ends to its maximum length based upon meeting Title 14 of the Code of Federal Regulations (CFR) Part 77 requirements, shown in **Exhibit 4-5**. Alternative 5 uses declared distances while clearing all roadways by 15 feet and maintaining a 1,000 foot wide primary surface. This creates 6,492 feet of usable runway with a full RSA and OFA on both runway ends that meets FAA design criteria. The Runway 4 end is extended 1,896 feet with a displaced threshold of 800 feet to allow for a takeoff runway available of 6,400 feet. The use of declared distances allows 6,492 feet of takeoff run available on the Runway 22 end. The landing distance available on the Runway 4 end is 5,600 feet and 6,492 feet on the Runway 22 end. The RPZ on the Runway 22 end encompasses small areas that are not controlled by the Airport, including areas of small businesses and a car dealership.

4.6 ALTERNATIVE 6 – INTERIM THRESHOLD – EXTENDING RUNWAY 4 END

Alternative 6 is based on extending the Runway 4 end 1,896 feet, as shown in Alternative 2, while maintaining the existing (interim) displaced threshold on the Runway 22 end. This would equate to a 7,396 foot runway through the use of declared distances on both runway ends. Runway 4 is

extended 1,100 feet with an additional 800 feet for use during takeoff; the threshold for Runway 22 will remain in its current location. As shown in **Exhibit 4-6**, there is a standard RSA and OFA on the Runway 4 end and nonstandard RSA and OFA of 600 feet and 350 feet respectively, on the Runway 22 end because of Centreville Road. There are small businesses, a car dealership, residential areas, Centreville Road, U.S. 50, and Airport Drive within the RPZ on the Runway 22 end.

5.0 TIER 1 ALTERNATIVES ANALYSIS

To evaluate these runway alternatives, a two-tier evaluation process has been used. The purpose of the Tier 1 evaluation is to reveal any fatal flaws, which would immediately eliminate the alternative from further consideration. Each of the alternatives have been screened using the criteria in Tier 1 and any alternatives that do not meet all Tier 1 criteria have been eliminated from further consideration. The alternatives that passed the first tier criteria will go on to be evaluated in more detail in the Tier 2 evaluation.

Six runway extension alternatives were generated as part of this analysis. The six alternatives were evaluated with respect to the following Tier 1 criteria:

- Runway Visibility Zone (RVZ)
- Roadway Clearance (14 CFR Part 77 requirements)
- Airport Traffic Control Tower (ATCT) Visibility
- Primary Surface
- Localizer Critical Area

5.1 RUNWAY VISIBILITY ZONE (RVZ)

The RVZ is an area formed by an imaginary line connecting the runways visibility points. The location of runway visibility points depends on the length of the runway beyond the runway intersection. These points are centered on the runway and there is a point for each end, creating four points for two intersected runways. The terrain needs to be graded and permanent objects need to be designed or sited so that there will be an unobstructed line of sight within the RVZ. Alternatives 2, 4, and 5 have a few trees located in the RVZ to the west of the runway intersection that will require clearing. After this tree removal, all of the alternatives would have an unobstructed RVZ.

5.2 ROADWAY CLEARANCE

14 CFR Part 77 states that there must be at least 10 feet of clearance over all private or access roads, 15 feet of clearance over all public roads, and 17 feet of clearance over all interstate highways for the 14 CFR Part 77 Imaginary Surfaces.

Runway 4-22 is surrounded by four roads that may have an impact on the runway dimensions. Glebe Road is situated to the south of the Runway 4 end, Airport Road runs north/northwest of the Runway

22 end, and Centreville Road and U.S. Route 50 run parallel and to the north/northeast of the Runway 22 end. All four roads are public roads requiring 15 feet of clearance from all 14 CFR Part 77 surfaces. The Part 77 surfaces associated with Alternatives 1, 2, and 5 clear the roads surrounding the Airport by at least 15 feet. Centreville Road is an obstruction to the approach surface to the Runway 22 end in Alternatives 3, 4, and 6. The approach surface on the Runway 22 end in Alternative 6 does not clear Centreville Road or U.S. Route 50 by 15 feet; therefore, both roads are obstructions.

5.3 AIRPORT TRAFFIC CONTROL TOWER (ATCT) VISIBILITY

There must be an unobstructed line-of-sight from the ATCT cab to all aircraft movement areas on the airfield. Additionally, the line-of-sight angle of incidence defines the minimum line-of-sight slant angle required for the ATCT operators to provide aircraft separation. The minimum line-of-sight angle of incidence is 0.80 degrees. For all alternatives, there is a clear line-of-sight and the angle of incidence exceeds 0.80 degrees.

5.4 PRIMARY SURFACE

The primary surface is a 14 CFR Part 77 Imaginary Surface that is longitudinally centered on the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the Runway centerline. It extends 200 feet from the runway ends on paved runways. The width of the primary surface varies with the classification of the runway but is the same width the entire length and is based on the most demanding approach existing for either Runway end. Alternatives 1 through 5 have no penetrations to the primary surface. Centreville Road penetrates the primary surface on the Runway 22 end in Alternative 6.

5.5 LOCALIZER CRITICAL AREA

The localizer (LOC) antenna is usually sited between 1,000 feet and 2,000 feet from the runway ends, outside the RSA on the extended runway centerline. The localizer critical area surrounds the LOC antenna and must be clear of objects and smoothly graded. Due to the relocated Runway 22 threshold, there is adequate space for a full LOC critical area if the antenna is relocated in Alternatives 1 through 5. Following the relocation of the LOC, its critical area will be unobstructed in Alternatives 1 through 5. The potential locations for each alternative will be investigated in the Tier 2 Analysis. There is not 1,000 feet available between the LOC critical area and the end of the runway in Alternative 6, therefore an unobstructed LOC critical area is not possible for this Alternative.

Table 5.0-1 provides a summary of all six alternatives and the result of the analysis using Tier 1 evaluation criteria.

TABLE 5.0-1
TIER 1 ANALYSIS

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5	Alt 6
RVZ	Yes	No*	Yes	Yes	No*	Yes
Roadway Clearance	Yes	Yes	No	No	Yes	No
ATCT Visibility	Yes	Yes	Yes	Yes	Yes	Yes
Primary Surface	Yes	Yes	Yes	Yes	Yes	No
Localizer Critical Area	Yes	Yes	Yes	Yes	Yes	No

*A few trees located west of the runway intersection would require clearing for an unobstructed RVZ.

5.6 SUMMARY OF ALTERNATIVES ANALYSIS

Alternative 1 passed all five Tier 1 evaluation criteria and is recommended to continue to Tier 2 for further analysis. In order for Alternatives 2 and 5 to pass all five Tier 1 evaluation criteria, a few trees would need to be cleared for an unobstructed RVZ. Alternatives 3 and 4 could pass the Tier 1 evaluation if a portion of Centreville Road can be closed. Concurrence is now requested of the FAA, Maryland Aviation Administration, and Talbot County regarding the alternatives that will undergo evaluation in Tier 2.

Tier 2 evaluation criteria will include:

- Safety considerations
- Development costs
- Environmental considerations
- Runway length requirements
- Flexibility
- Land acquisition needs
- Strategic Airport goals
- Part 77 obstruction considerations

On July 22, 2008 the Talbot County Council voted to evaluate Alternatives 1, 2, and 5 in the Runway 4-22 Extension Analysis Tier 2 Evaluation. Alternatives 3 and 4 were eliminated from further consideration because a portion of Centreville Road is in the Primary surface and cannot be closed or relocated. The letter of recommendation from the Talbot County Council is provided in **Appendix A**.

6.0 TIER 2 ALTERNATIVES ANALYSIS

Based on the Tier 1 evaluation and analysis, the Talbot County Council voted to select Alternatives 1, 2, and 5 for further study in this Tier 2 Evaluation. These alternatives meet all roadway clearance

requirements, have a clear line-of-sight from the ATCT, and have no roadway obstructions to the primary surface. A few trees are located within the RVZ of Alternatives 2 and 5; Alternative 1 does not contain any obstructions to the RVZ. The localizer will be relocated in all alternatives in order to meet the critical area requirements. After the localizer is relocated, there will be no obstructions to the localizer critical area in all three alternatives. In addition to the criteria noted above, the alternatives in this Tier 2 Analysis meet all FAA design criteria as established in AC 150/5300-13 Change 13.

The goal of Tier 2 is to further analyze and compare the selected Alternatives from Tier 1. Prior to completion of the Tier 2 Analysis, a review of the applicability of the Tier 2 evaluation criteria was performed. Based on this review, the following evaluation criteria were eliminated from the Tier 2 Evaluation:

- **Safety considerations** - An assessment of compliance with FAA standards that may have an influence on the safe movement of aircraft was conducted for each runway alternative. Because all three of the alternatives are rated equally in the level of safety each design provided, this evaluation criteria was eliminated. Any alternatives that did not meet FAA safety standards were eliminated in the Tier 1 evaluation.

- **Flexibility -** The flexibility of an alternative pertains to the total growth potential of each alternative and the process inherent to achieving that growth. The phasing of development is typically considered with respect to airfield operations that will take place during the time of construction. Because all of the alternatives have similar phasing and will not be a determining factor in selecting an alternative this evaluation criteria was eliminated.

- **Strategic goals** - All remaining alternatives will meet the strategic goals of the Airport.

- **Development costs** - Based on comments received from the FAA, development costs were removed as part of the Tier 2 evaluation. A cost estimate for only the selected alternative is provided.

Therefore, in the Tier 2 analysis, Alternatives 1, 2, and 5 have been evaluated using the following criteria:

- Environmental considerations
- Runway length requirements
- Land acquisition needs
- 14 CFR Part 77 obstructions
- Compatibility with other Airport projects

The runway alternatives were evaluated quantitatively based on these criteria using a ranking system. This system assigned a numerical ranking from 1 (lowest) to 5 (highest). After ranking each

alternative relative to each criterion, the individual ranks were totaled to produce a score for the alternative. Each criterion and associated evaluation is described below.

6.1 ENVIRONMENTAL CONSIDERATIONS

The environmental considerations include potential impacts to wetlands, DFS habitat, and forest conservation (see **Exhibits 6-1**, **6-2**, and **6-3**). The 2006 ALP Update identified three areas that are inhabited by the DFS within the vicinity of the Airport. The ALP Update also identified 10 areas of wetlands on Airport property as well as several adjacent parcels for a total of 12 acres.

Each runway alternative has tree obstructions off Airport property that would need to be mitigated. **Table 6.0-1** summarizes the obstructions to each alternative.

TABLE 6.0-1
SUMMARY OF ENVIRONMENTAL IMPACTS

	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 5 (acres)
Wetlands	7.2	7.2	7.2
DFS Habitat	5.8	5.8	5.8
Forested Areas	5.6	5.6	5.6
Tree and Brush Obstructions	25.9	30.2	30.7

6.2 RUNWAY LENGTH REQUIREMENTS

The operational effectiveness and functionality of the runway alternatives were evaluated with respect to their ability to meet the required runway length determined in the 2006 ALP Update. The 2006 ALP Update recommended a runway length of 6,900 feet to accommodate a Gulfstream IV as the critical aircraft.

Therefore, every effort was made to provide the maximum runway length for this analysis. Alternative 1 provides a 5,600 foot runway. Alternatives 2 and 5 provide 6,400 and 6,492 foot runways respectively, through the use of declared distances.

6.3 LAND ACQUISITION NEEDS

As stated in AC 150/5300-13 Change 13, the FAA prefers the RPZs to be controlled by the Airport. Portions of the RPZ on the proposed Runway 22 end and most of the RPZ on the proposed Runway 4 end in each alternative are not controlled by the Airport. **Table 6.3-1** shows the number of parcels, acres, and cost of acquiring the Runway 4-22 RPZ through fee simple acquisition.

TABLE 6.3-1
LAND ACQUISITION TOTALS FOR FEE SIMPLE - RPZ

	Alternative 1	Alternative 2	Alternative 5
Number of Parcels - Fee Simple	10	10	10
Number of Acres - Fee Simple	92.7	92.7	92.7
Estimated Cost - Fee Simple	$10,967,876	$10,967,876	$10,967,876

All three alternatives have obstructions to 14 CFR Part 77 surfaces on parcels surrounding Airport property that must be mitigated through acquisition either by avigation easement or fee simple. See **Section 6.4** for a description of the 14 CFR Part 77 obstructions. **Table 6.3-2** shows the number of parcels, acres and cost of mitigating tree obstructions through avigation easement. Detailed property information can be found in **Appendix B**.

TABLE 6.3-2
LAND ACQUISITION TOTALS FOR AVIGATION EASEMENT

	Alternative 1	Alternative 2	Alternative 5
Number of Parcels - Avigation Easement	37	41	43
Number of Acres - Avigation Easement	10.5	13.6	14.4
Estimated Cost - Avigation Easement	$11,601,764	$11,709,809	$11,743,047

The parcels that need to be acquired for Alternatives 1, 2, and 5 are shown in **Exhibits 6-4**, **6-5** and **6-6**, respectively.

6.4 14 CFR PART 77 OBSTRUCTIONS

All of the alternatives have obstructions to 14 CFR Part 77 primary, approach, and transitional surfaces. An avigation easement for tree clearing will be needed to be acquired for all off-Airport parcels with obstructions to Runway 4-22. The amount of on-Airport tree and brush obstructions and ground obstructions are similar for each alternative. The on-airport obstructions for each alternative are shown in **Table 6.4-1**.

TABLE 6.4-1
ON-AIRPORT OBSTRUCTIONS

	Alternative 1 (acres)	Alternative 2 (acres)	Alternative 5 (acres)
Tree and Brush	9.8	9.8	9.8
Ground	5.5	5.5	4.7

The off-airport obstructions to 14 CFR Part 77 are shown in **Table 6.4-2**.

TABLE 6.4-2
OFF-AIRPORT OBSTRUCTIONS

	Alternative 1	Alternative 2	Alternative 5
Tree and Brush	10.5 acres	14.9 acres	16.1 acres
Manmade[1]	9	18	18

[1]These manmade obstructions include utility poles, light poles, and smoke-stacks.

All obstructions for Alternative 1, 2, and 5 are shown in **Exhibits 6-4**, **6-5**, and **6-6**, respectively.

6.5 COMPATIBILITY WITH OTHER AIRPORT PROJECTS

At the time of this study, there are two projects currently ongoing at the Airport: the installation of airfield signage and the design of the expansion and rehabilitation of the South Apron, expansion of Taxiway H, and the rehabilitation of two landside service roads (Jet Lane and Corkran Road).

One component of the airfield signage project involves electrical upgrades to the existing power supply. The electrical upgrades were designed to accommodate the newly installed airfield signs as well as the runway extension and associated light systems.

As originally proposed, a portion of the South Apron would be expanded to the south. The expansion is not compatible with the existing RVZ; however, the RVZ associated with Alternatives 1, 2 and 5 would allow for the expansion to the south. Given the uncertainty of timing for construction of the runway extension, coordination is ongoing with the FAA to determine the appropriate limits of the apron expansion.

6.6 SUMMARY OF ALTERNATIVES

Table 6.6-1 shows the numerical range and associated score for each evaluation criteria.

TABLE 6.6-1
TIER 2 EVALUATION SCALES

	1	2	3	4	5
Environmental Considerations	Severe Impact		Some Impact		No Impact
Runway Length (Feet)	5,400-5,700	5,700-6,000	6,000-6,300	6,300-6,600	6,600-6,900
Land Acquisition (Number of Parcels)	46-48	43-45	40-42	37-39	34-36
14 CFR Part 77 Obstructions (acres)	34-36	31-33	28-30	25-27	22-24
Compatibility w/ other Airport Projects	Severe Impact		Some Impact		No Impact

Using the numerical ranges above, Alternatives 1, 2, and 5 were assigned a score. (See **Table 6.6-2**)

TABLE 6.6-2
RUNWAY ALTERNATIVES TIER 2 EVALUATION MATRIX

	Alternative 1	Alternative 2	Alternative 5
Environmental Considerations	3	3	3
Runway Length (Feet)	1	4	4
Land Acquisition (Number of Parcels)	4	3	2
14 CFR Part 77 Obstructions (acres)	4	3	3
Compatibility with other Airport Projects	5	5	5
Total Score:	**17**	**18**	**17**

7.0 RECOMMENDED RUNWAY EXTENSION ALTERNATIVE

Based on the quantitative evaluation, Alternative 2 is the recommended runway extension alternative.

8.0 DEVELOPMENT COSTS

Estimated construction costs for Alternative 2 are presented below in **Table 8.0-1**.

TABLE 8.0-1
DEVELOPMENT COSTS

Development	Cost ($)
Airfield Development[1]	8,034,624
Land Acquisition	
Estimated Cost for Fee Simple[2]	10,967,876
Estimated Cost for Avigation Easement[3]	741,933
Relocation of SFA	5,000,000
Environmental Mitigation	
Wetlands	1,080,000
DFS Habitat	99,500
Forested Areas (Forest Conservation Act)	56,000
Pervious Surface to Impervious Surface (Forest Conservation Act)	33,939
Total	**$26,013,872**

Source: Maryland Department of Assessment and Taxation, Real Property Data Search
[1] Detailed Cost Estimate is provided in **Appendix C**
[2] Current Tax Assessors Appraised Value as of July 1, 2008
[3] The percentage of each parcel containing obstructions was calculated. This percentage was multiplied by the total parcel value, which was then multiplied by 30 percent to represent the value of the avigation easement.

LEGEND

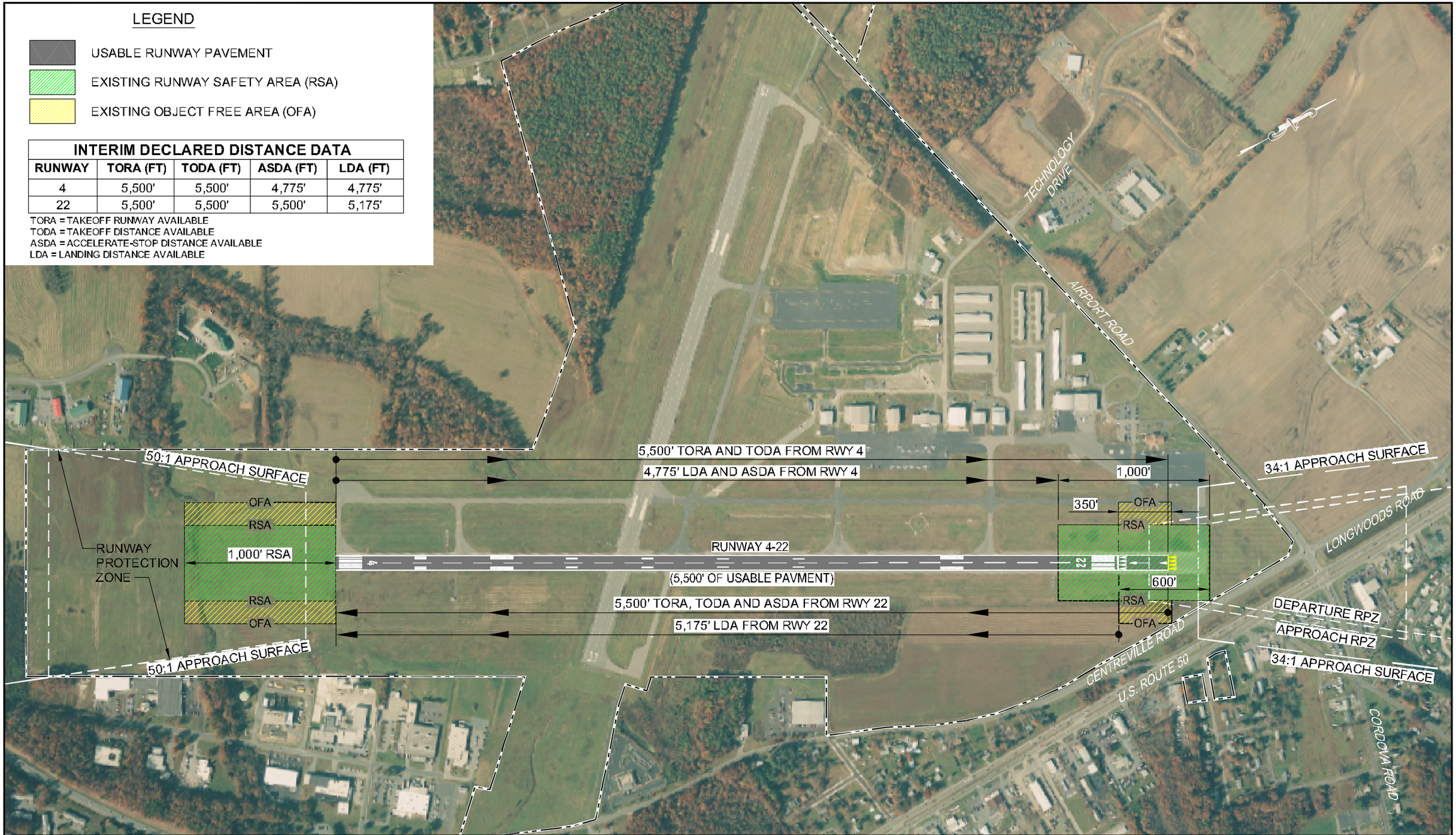
USABLE RUNWAY PAVEMENT

EXISTING RUNWAY SAFETY AREA (RSA)

EXISTING OBJECT FREE AREA (OFA)

INTERIM DECLARED DISTANCE DATA				
RUNWAY	TORA (FT)	TODA (FT)	ASDA (FT)	LDA (FT)
4	5,500'	5,500'	4,775'	4,775'
22	5,500'	5,500'	5,500'	5,175'

TORA = TAKEOFF RUNWAY AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ASDA = ACCELERATE-STOP DISTANCE AVAILABLE
LDA = LANDING DISTANCE AVAILABLE



EASTON AIRPORT

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

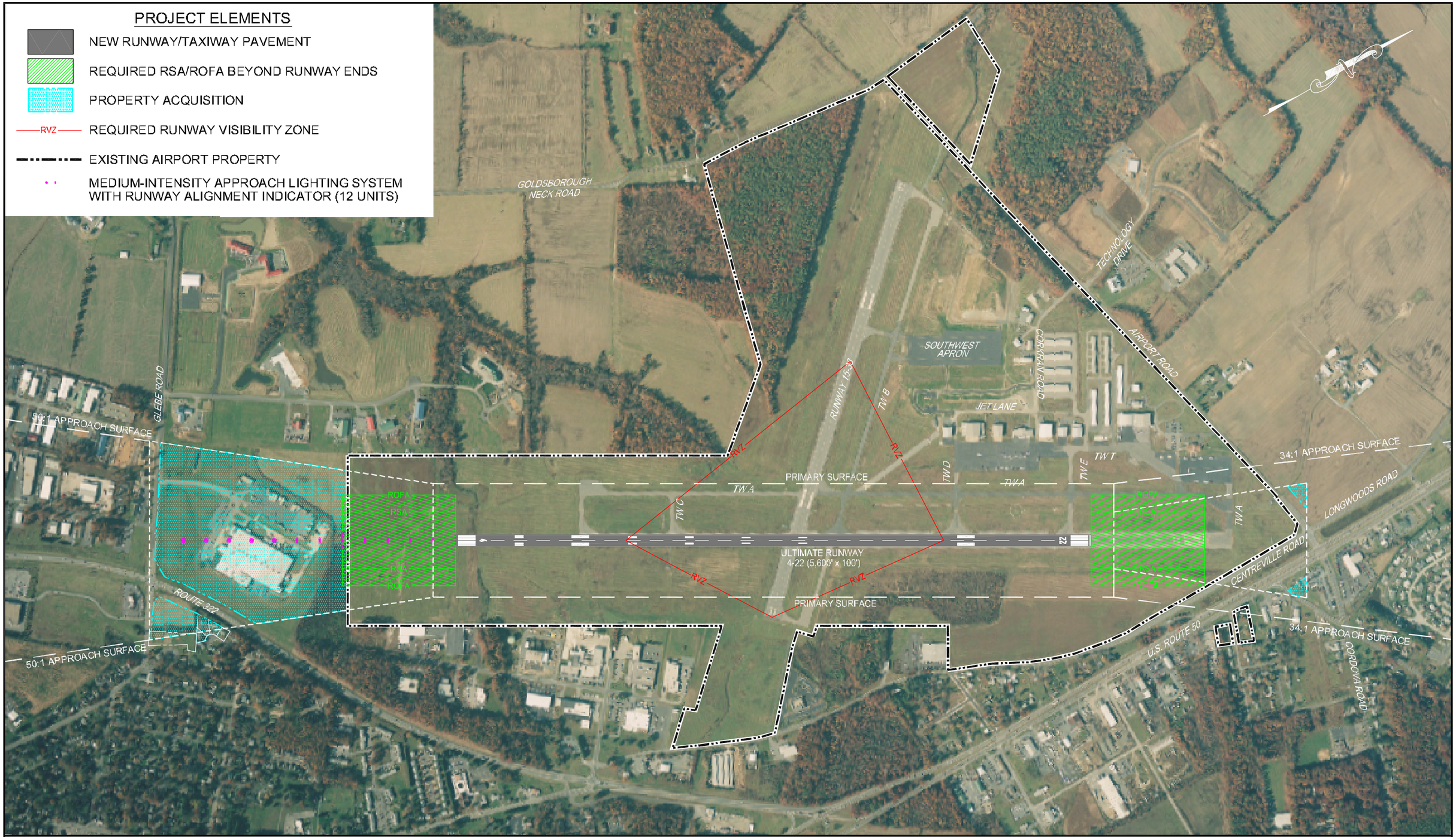
RUNWAY 4-22 ALTERNATIVES ANALYSIS
EXISTING CONDITIONS

EXHIBIT
3-1

FILE NAME: P:\C3DProjects\20830885\Planning\RW_Alts\C-DECL-DIST-ESN_EXIST.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:24am

PROJECT ELEMENTS

- NEW RUNWAY/TAXIWAY PAVEMENT
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- RVZ — REQUIRED RUNWAY VISIBILITY ZONE
- EXISTING AIRPORT PROPERTY
- MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (12 UNITS)



EASTON AIRPORT

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 1
(5,600' RUNWAY)

EXHIBIT
4-1

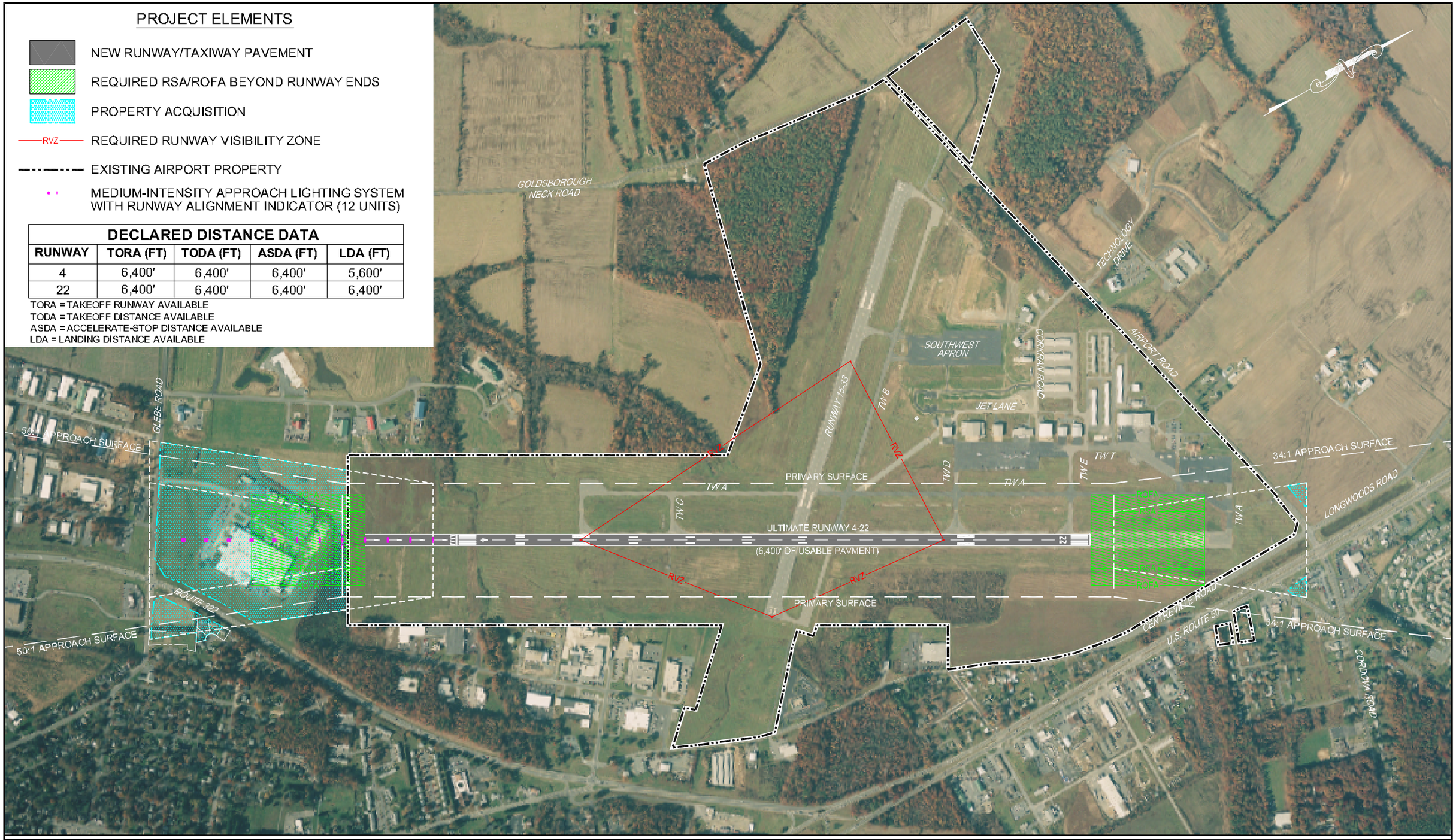
FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT1-4-22-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:27am

PROJECT ELEMENTS

- NEW RUNWAY/TAXIWAY PAVEMENT
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- RVZ — REQUIRED RUNWAY VISIBILITY ZONE
- EXISTING AIRPORT PROPERTY
- MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (12 UNITS)

DECLARED DISTANCE DATA				
RUNWAY	**TORA (FT)**	**TODA (FT)**	**ASDA (FT)**	**LDA (FT)**
4	6,400'	6,400'	6,400'	5,600'
22	6,400'	6,400'	6,400'	6,400'

TORA = TAKEOFF RUNWAY AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ASDA = ACCELERATE-STOP DISTANCE AVAILABLE
LDA = LANDING DISTANCE AVAILABLE



EASTON AIRPORT

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

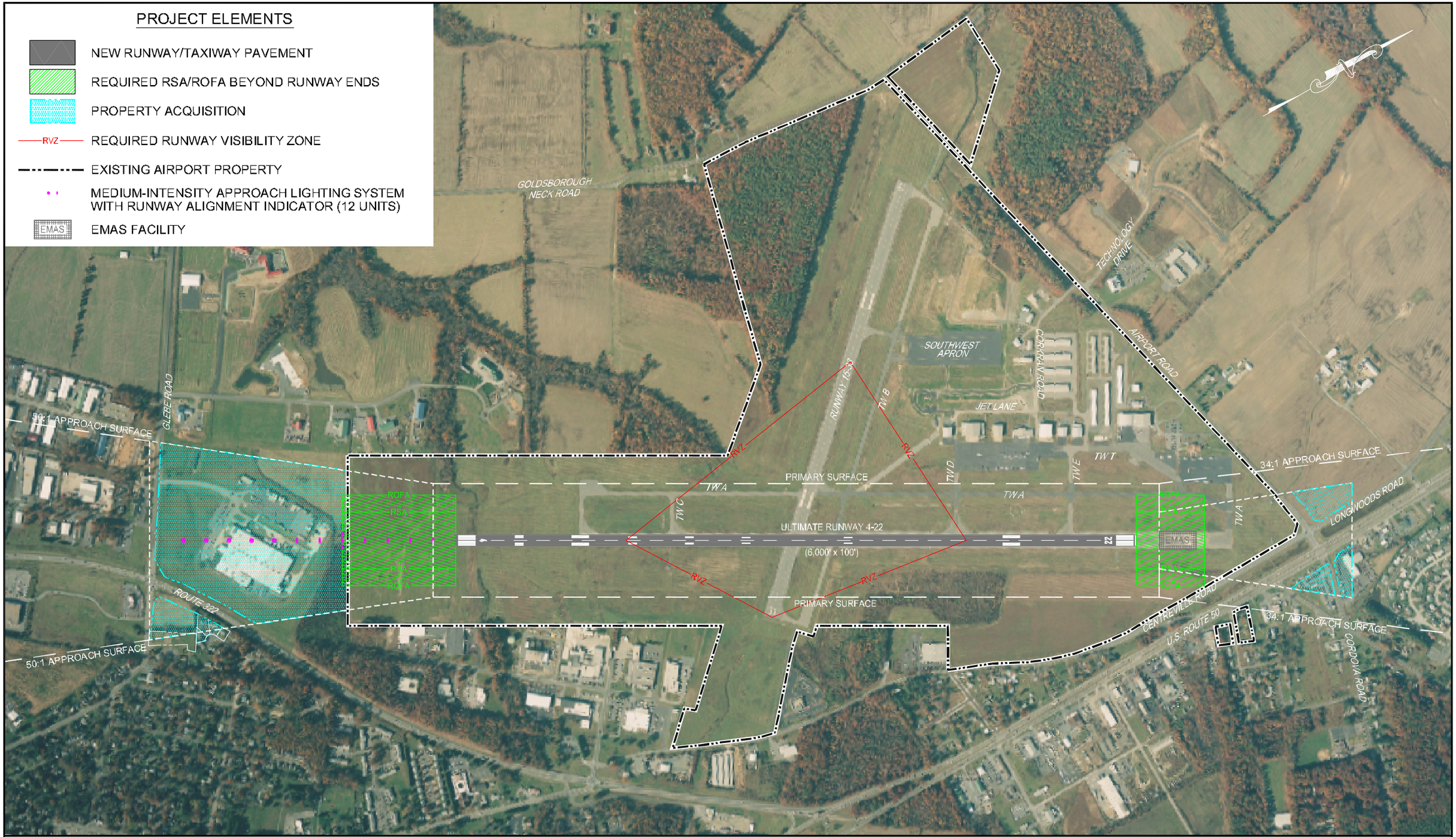
RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 2
(6,400' USABLE RUNWAY THROUGH THE USE OF DECLARED DISTANCES)

EXHIBIT
4-2

FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT2-4-22-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:29am

PROJECT ELEMENTS

- NEW RUNWAY/TAXIWAY PAVEMENT
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- RVZ — REQUIRED RUNWAY VISIBILITY ZONE
- EXISTING AIRPORT PROPERTY
- MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (12 UNITS)
- EMAS — EMAS FACILITY



EASTON AIRPORT — AVIATION GATEWAY TO EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 3
(6,000' RUNWAY THROUGH THE USE OF EMAS ON THE RUNWAY 22 END)

EXHIBIT
4-3

FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT3-4-22-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:31am

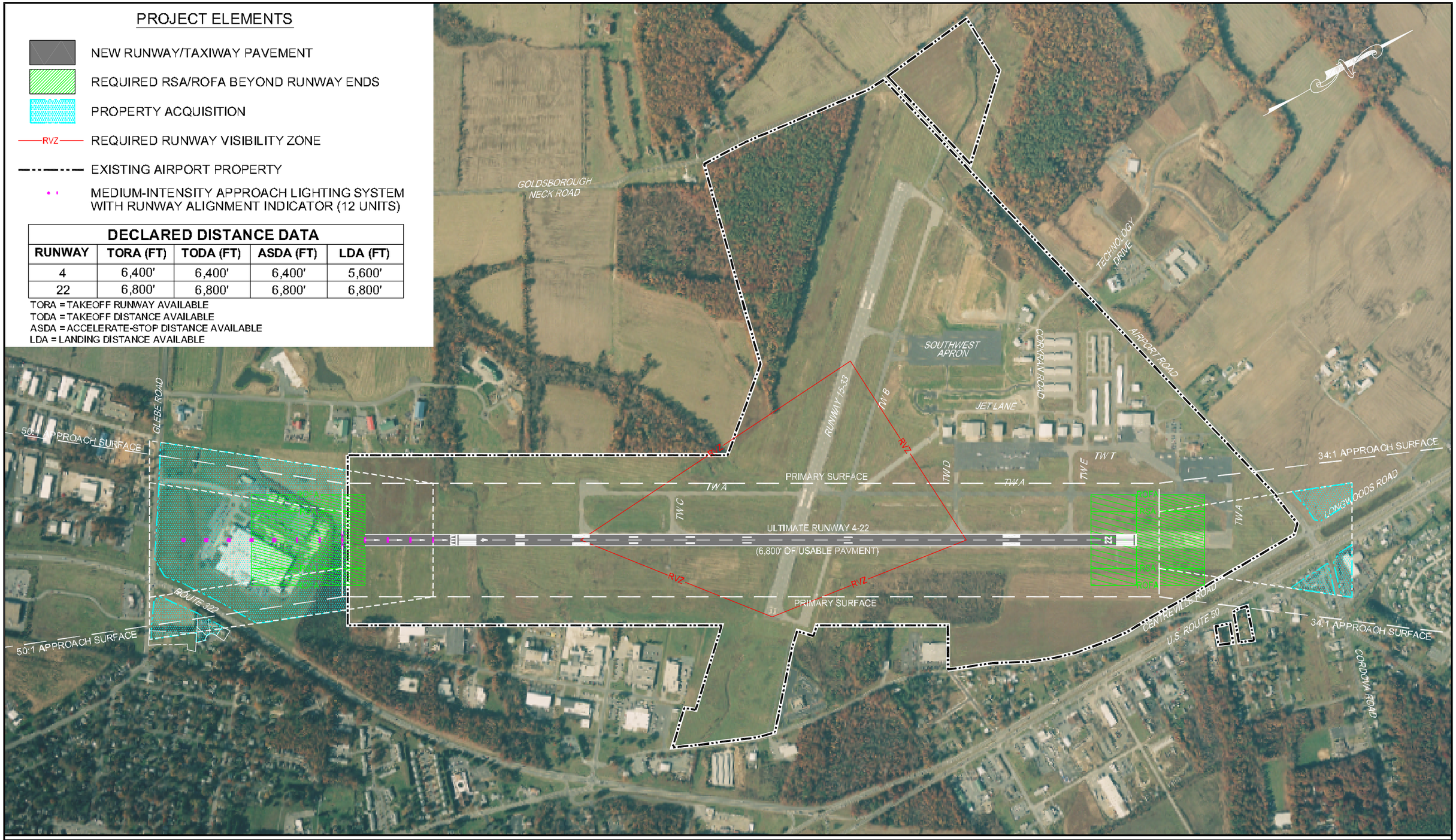
PROJECT ELEMENTS

- NEW RUNWAY/TAXIWAY PAVEMENT
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- RVZ — REQUIRED RUNWAY VISIBILITY ZONE
- EXISTING AIRPORT PROPERTY
- MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (12 UNITS)

DECLARED DISTANCE DATA

RUNWAY	TORA (FT)	TODA (FT)	ASDA (FT)	LDA (FT)
4	6,400'	6,400'	6,400'	5,600'
22	6,800'	6,800'	6,800'	6,800'

TORA = TAKEOFF RUNWAY AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ASDA = ACCELERATE-STOP DISTANCE AVAILABLE
LDA = LANDING DISTANCE AVAILABLE



EASTON AIRPORT

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 4
(6,800' USABLE RUNWAY THROUGH THE USE OF DECLARED DISTANCES)

EXHIBIT
4-4

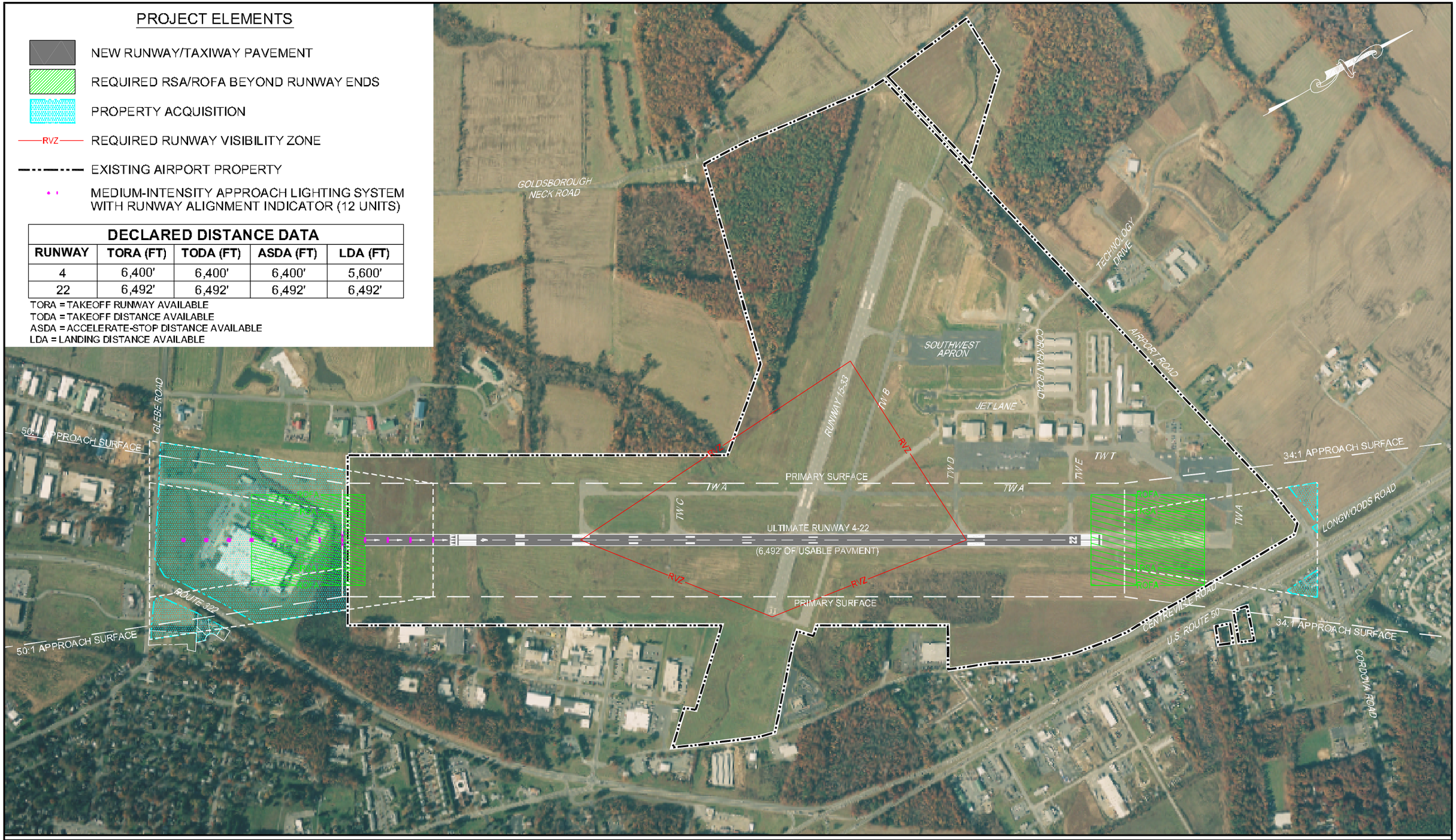
FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT4-4-22-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:32am

PROJECT ELEMENTS

- NEW RUNWAY/TAXIWAY PAVEMENT
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- RVZ — REQUIRED RUNWAY VISIBILITY ZONE
- EXISTING AIRPORT PROPERTY
- MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (12 UNITS)

DECLARED DISTANCE DATA				
RUNWAY	**TORA (FT)**	**TODA (FT)**	**ASDA (FT)**	**LDA (FT)**
4	6,400'	6,400'	6,400'	5,600'
22	6,492'	6,492'	6,492'	6,492'

TORA = TAKEOFF RUNWAY AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ASDA = ACCELERATE-STOP DISTANCE AVAILABLE
LDA = LANDING DISTANCE AVAILABLE



EASTON AIRPORT

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 5
(6,492' USABLE RUNWAY THROUGH THE USE OF DECLARED DISTANCES)

EXHIBIT
4-5

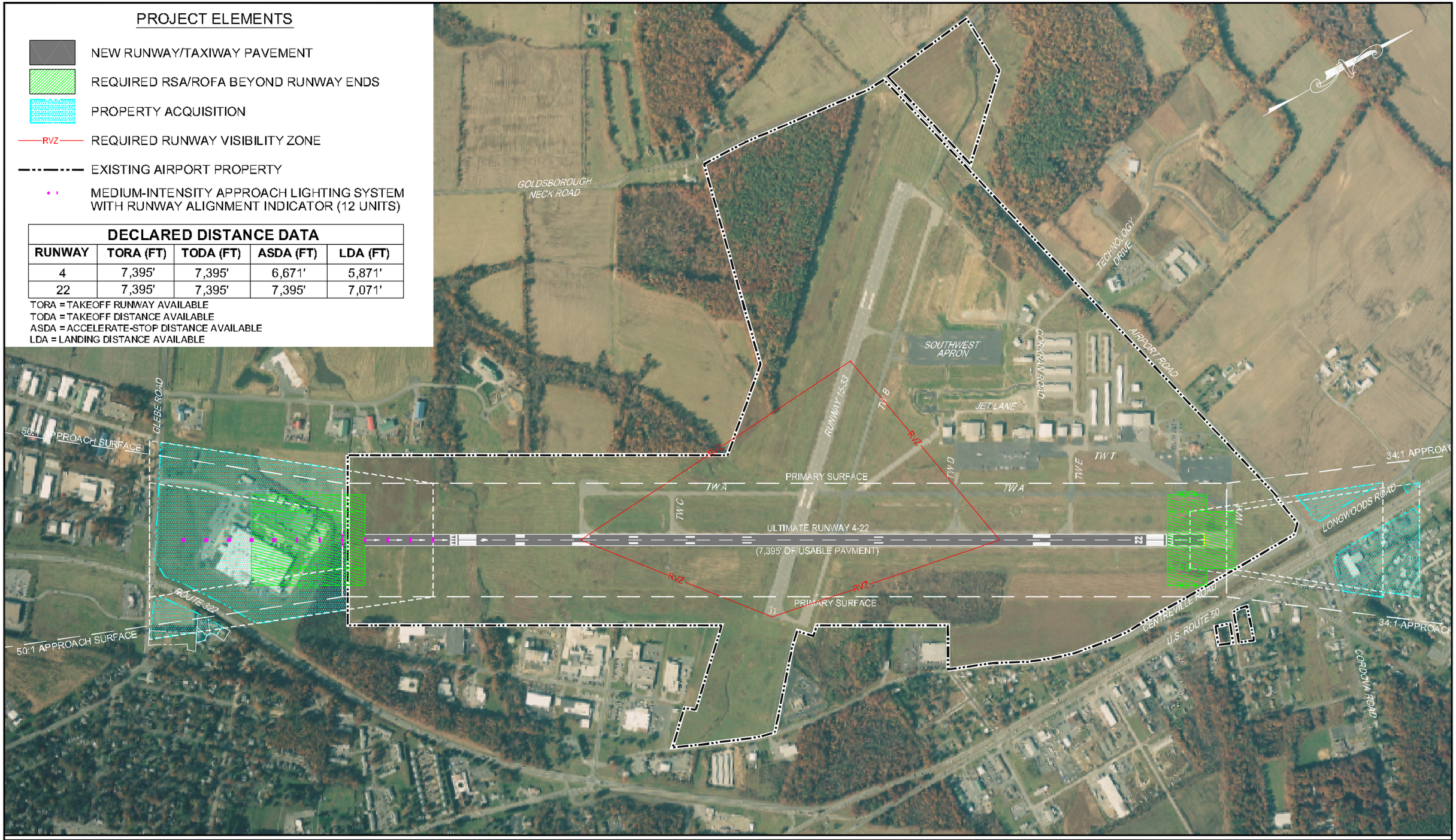
FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT5-4-22-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:35am

PROJECT ELEMENTS

- NEW RUNWAY/TAXIWAY PAVEMENT
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- RVZ — REQUIRED RUNWAY VISIBILITY ZONE
- EXISTING AIRPORT PROPERTY
- MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM WITH RUNWAY ALIGNMENT INDICATOR (12 UNITS)

DECLARED DISTANCE DATA				
RUNWAY	**TORA (FT)**	**TODA (FT)**	**ASDA (FT)**	**LDA (FT)**
4	7,395'	7,395'	6,671'	5,871'
22	7,395'	7,395'	7,395'	7,071'

TORA = TAKEOFF RUNWAY AVAILABLE
TODA = TAKEOFF DISTANCE AVAILABLE
ASDA = ACCELERATE-STOP DISTANCE AVAILABLE
LDA = LANDING DISTANCE AVAILABLE



EASTON AIRPORT

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 6
(MAINTAINING INTERIM THRESHOLD AND EXTENDING RUNWAY 4 END)

EXHIBIT
4-6

FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT6-4-22-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Thursday, June 26, 2008 - 11:21am

PROJECT ELEMENTS

- WETLANDS
- DELMARVA FOX SQUIRREL HABITAT
- USABLE RUNWAY/NEW TAXIWAY
- TREE AND BRUSH OBSTRUCTIONS
- GROUND OBSTRUCTIONS
- MANMADE OBSTRUCTION POINTS
- EXISTING AIRPORT PROPERTY

Source:
Wetlands and DFS Habitat - July 2006 ALP Sheet No. 20
Obstructions - URS Corporation, 2008

EASTON AIRPORT
AVIATION GATEWAY TO THE EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 1
(ENVIRONMENTAL CONSIDERATIONS)

EXHIBIT
6-1

FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT1-OBST-ESN.dwg LAYOUT NAME: environmental PLOTTED: Friday, October 10, 2008 - 2:48pm

PROJECT ELEMENTS

- WETLANDS
- DELMARVA FOX SQUIRREL HABITAT
- USABLE RUNWAY/NEW TAXIWAY
- TREE AND BRUSH OBSTRUCTIONS
- GROUND OBSTRUCTIONS
- MANMADE OBSTRUCTION POINTS
- EXISTING AIRPORT PROPERTY

Source:
Wetlands and DFS Habitat - July 2006 ALP Sheet No. 20
Obstructions - URS Corporation, 2008

EASTON AIRPORT
AVIATION GATEWAY TO THE EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 2
(ENVIRONMENTAL CONSIDERATIONS)

EXHIBIT
6-2

FILE NAME: P:\C3DProjects\20830885\Planning\RW_Alts\C-ALT2-OBST-ESN.dwg LAYOUT NAME: environmental PLOTTED: Friday, October 10, 2008 - 2:51pm

PROJECT ELEMENTS

- WETLANDS
- DELMARVA FOX SQUIRREL HABITAT
- USABLE RUNWAY/NEW TAXIWAY
- TREE AND BRUSH OBSTRUCTIONS
- GROUND OBSTRUCTIONS
- MANMADE OBSTRUCTION POINTS
- EXISTING AIRPORT PROPERTY

Source:
Wetlands and DFS Habitat - July 2006 ALP Sheet No. 20
Obstructions - URS Corporation, 2008

EASTON AIRPORT
AVIATION GATEWAY TO THE EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 5
(ENVIRONMENTAL CONSIDERATIONS)

EXHIBIT
6-3

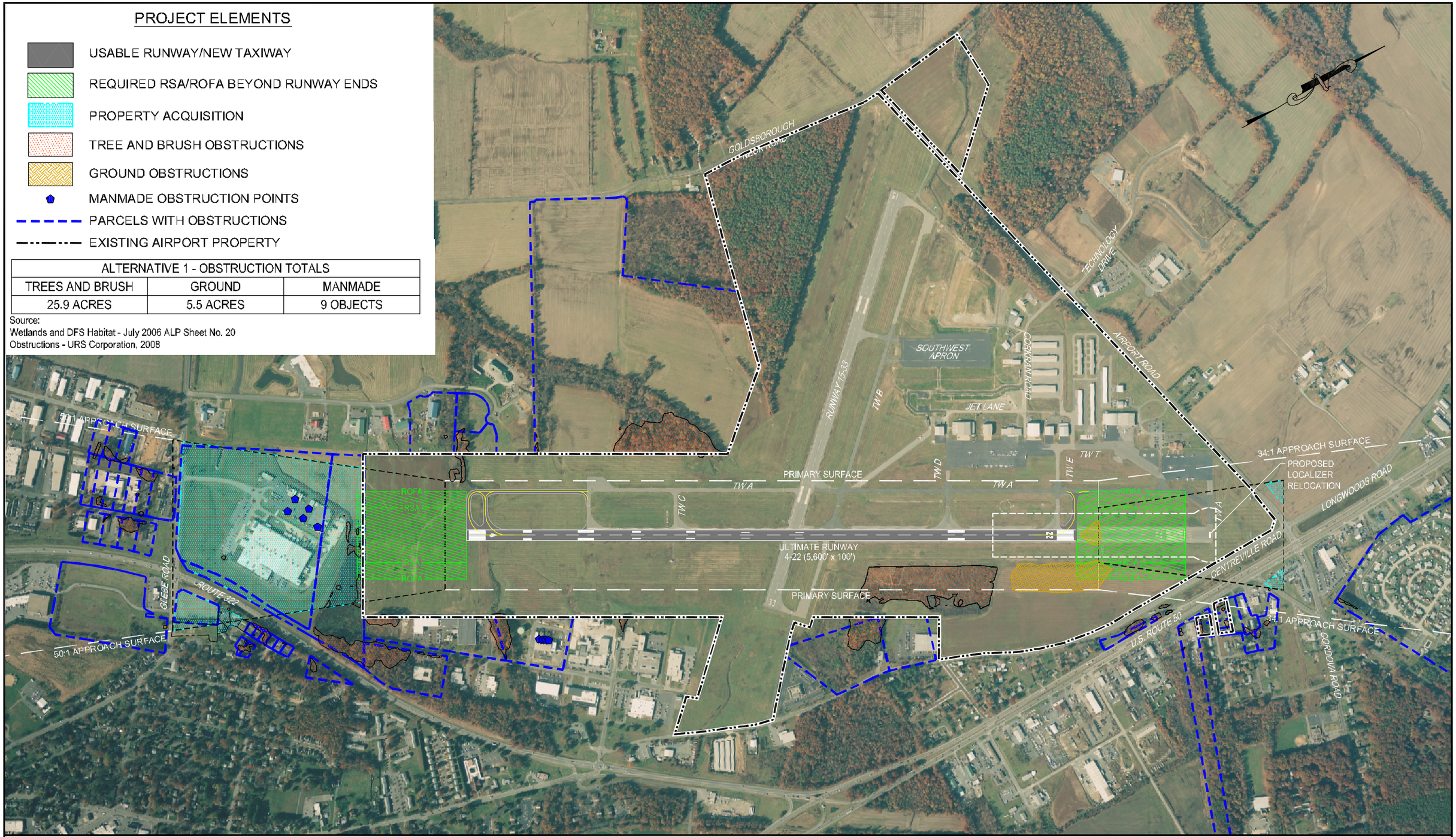
FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT5-OBST-ESN.dwg LAYOUT NAME: environmental PLOTTED: Friday, October 10, 2008 - 2:53pm

PROJECT ELEMENTS

- USABLE RUNWAY/NEW TAXIWAY
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- TREE AND BRUSH OBSTRUCTIONS
- GROUND OBSTRUCTIONS
- MANMADE OBSTRUCTION POINTS
- PARCELS WITH OBSTRUCTIONS
- EXISTING AIRPORT PROPERTY

ALTERNATIVE 1 - OBSTRUCTION TOTALS		
TREES AND BRUSH	GROUND	MANMADE
25.9 ACRES	5.5 ACRES	9 OBJECTS

Source:
Wetlands and DFS Habitat - July 2006 ALP Sheet No. 20
Obstructions - URS Corporation, 2008



EASTON AIRPORT
AVIATION GATEWAY TO THE EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 1
(OBSTRUCTION ANALYSIS)

EXHIBIT
6-4

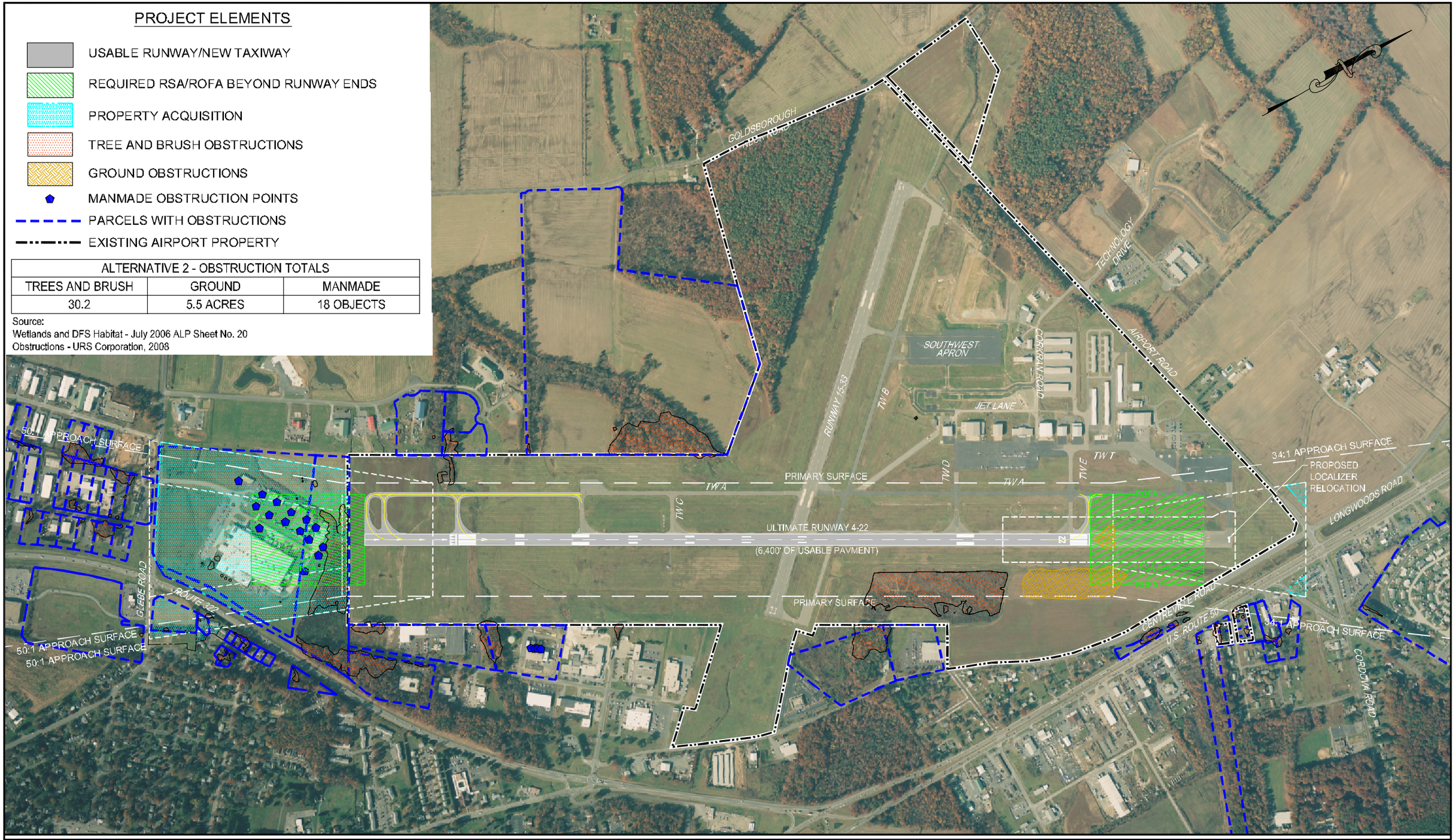
FILE NAME: P:\C3DProjects\20830885\Planning\RW_Alts\C-ALT1-OBST-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Friday, October 10, 2008 - 2:50pm

PROJECT ELEMENTS

- USABLE RUNWAY/NEW TAXIWAY
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- TREE AND BRUSH OBSTRUCTIONS
- GROUND OBSTRUCTIONS
- MANMADE OBSTRUCTION POINTS
- PARCELS WITH OBSTRUCTIONS
- EXISTING AIRPORT PROPERTY

ALTERNATIVE 2 - OBSTRUCTION TOTALS		
TREES AND BRUSH	GROUND	MANMADE
30.2	5.5 ACRES	18 OBJECTS

Source:
Wetlands and DFS Habitat - July 2006 ALP Sheet No. 20
Obstructions - URS Corporation, 2008



EASTON AIRPORT
AVIATION GATEWAY TO THE EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 2
(OBSTRUCTION ANALYSIS)

EXHIBIT
6-5

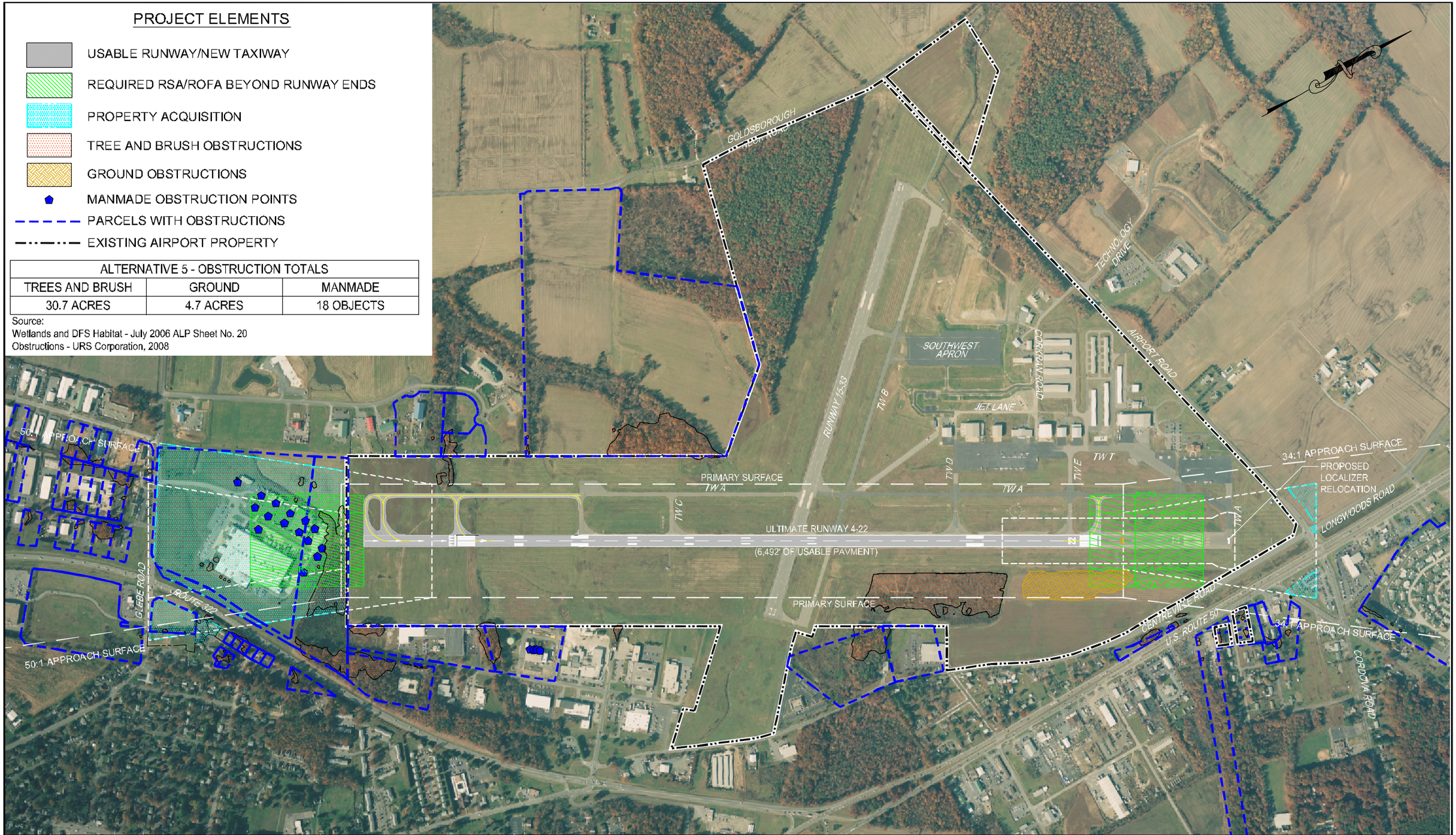
FILE NAME: P:\C3DProjects\20830885\Planning\RW_Alts\C-ALT2-OBST-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Friday, October 10, 2008 - 2:52pm

PROJECT ELEMENTS

- USABLE RUNWAY/NEW TAXIWAY
- REQUIRED RSA/ROFA BEYOND RUNWAY ENDS
- PROPERTY ACQUISITION
- TREE AND BRUSH OBSTRUCTIONS
- GROUND OBSTRUCTIONS
- MANMADE OBSTRUCTION POINTS
- PARCELS WITH OBSTRUCTIONS
- EXISTING AIRPORT PROPERTY

ALTERNATIVE 5 - OBSTRUCTION TOTALS		
TREES AND BRUSH	GROUND	MANMADE
30.7 ACRES	4.7 ACRES	18 OBJECTS

Source:
Wetlands and DFS Habitat - July 2006 ALP Sheet No. 20
Obstructions - URS Corporation, 2008



EASTON AIRPORT
AVIATION GATEWAY EASTERN SHORE

EASTON/NEWNAM FIELD
EASTON, MARYLAND

RUNWAY 4-22 EXTENSION ANALYSIS

400 0 200 400 800
SCALE IN FEET

RUNWAY 4-22 ALTERNATIVES ANALYSIS
ALTERNATIVE 5
(OBSTRUCTION ANALYSIS)

EXHIBIT
6-6

FILE NAME: P:\C3DProjects\20830985\Planning\RW_Alts\C-ALT5-OBST-ESN.dwg LAYOUT NAME: color exhibit PLOTTED: Friday, October 10, 2008 - 2:53pm

APPENDIX A: LETTER FROM TALBOT COUNTY COUNCIL

EASTON AIRPORT

TOWER 118.525
GROUND 119.075
UNICOM 122.95
ATIS / AWOS 124.475
ILS 109.35
CLRNC 126.9

29137 NEWNAM ROAD, UNIT ONE, EASTON, MD 21601 TEL: 410.770.8055 FAX: 410.822.8694 WWW.EASTONAIRPORT.COM

July 23, 2008

Ms. Jennifer Lutz
URS Corporation
4 North Park Drive, Suite 300
Hunt Valley, MD 21030

RE: RW 4-22 Extension Analysis Tier 1 Evaluation

Dear Ms. Lutz

On July 22, 2008 the Talbot County Council voted unanimously to proceed with the Runway 4-22 Extension Analysis Tier 2 Evaluation. Alternates 1, 2 and 5 are to be evaluated.

If you have any questions please call.

Sincerely,

Mike Henry
Airport Manager

cc: Talbot County Council
Andy Hollis County Manager
Wayne Switzer Federal Aviation Administration
Ashish Solanki Maryland Aviation Administration
Mike Pullen County Attorney

APPENDIX B: LAND ACQUISITION

LAND ACQUISITION - ALTERNATIVE 1								
MAP	PARCEL	LOT	OWNER	ADDRESS	ACRES OF OBSTRUCTIONS	TOTAL ACRES OF PARCEL	VALUE[$]	COST OF AVIGATION EASEMENT
25	13		JENSEN'S INC.	9632 HYDE PARK CT	0.07	94.02	$4,787,066	$1,102
25	16		C S TARBUTTON INC.	9541 OCEAN GATEWAY	0.07	0.88	$328,700	$7,590
25	19		OCEAN GATEWAY LLC	CENTREVILLE ROAD	0.18	0.72	$59,666	$4,582
25	46	8	TRINTAUDON, LLC	8977 MISTLETOE DRIVE	0.01	5.29	$899,732	$754
25	46	9A	SHAW FAMILY TRUST	BRYAN DRIVE	0.02	2.19	$286,000	$690
25	46	9B	OXFORD LAWN AND LANDSCAPE, INC.	9055 BRYAN DRIVE	0.35	2.06	$412,266	$21,117
25	48		RPM 50, LLC	9477 OCEAN GATEWAY	0.04	7.78	$710,800	$1,074
25	103		YI, KYOM AND YI, KYUNGWON T/C	9561 CORDOVA ROAD	0.11	1.55	$302,066	$6,525
25	138		TOWN OF EASTON	GOLDSBOROUGH NECK ROAD	5.00	86.25	$227,700	$4,465
25	147		TOWN OF EASTON	GOLDSBOROUGH NECK ROAD	0.12	3.10	$15,500	$186
25	219		DELMARVA REAL ESTATE MANAGEMENT GROUP LLC	9529 OCEAN GATEWAY	0.01	1.00	$214,710	$475
25	232	1	QUICK, JAMES A. AND MARY G.	9510 SERVICE LANE	0.03	0.48	$205,636	$4,151
25	238	3	WATERFOWL FESTIVAL, INC.	9210 CENTREVILLE ROAD	1.24	7.27	$271,566	$14,113
25	238	4	DELMARVA FOUNDATION FOR MEDICAL CARE, INC.	9240 CENTREVILLE ROAD	0.11	5.00	$2,610,566	$17,535
100	38		DELMARVA BANK DATA PROCESSING CENTER INC.	GLEBE PARK DRIVE	1.48	6.62	$1,739,900	$118,010
100	40		WHALEN COMPANY, INC.	8900 GLEBE ROAD	0.05	7.72	$3,889,300	$138,497
100	41		TOWN OF EASTON	840 GLEBE ROAD	0.06	6.84	$625,566	$24,161
101	4	1		GLEBE ROAD	0.05			
101	4	2	E AND H PROPERTIES, LLC	8694 COMMERCE DRIVE	0.25	1.00	$525,400	$39,739
101	4	3,4,5	DELAWARE COCA-COLA BOTTLING CO INC. C/O COCA COLA	321 COMMERCE DRIVE	0.20	5.09	$1,343,432	$15,859
101	4	26	BUGG PROPERTIES LLC	8659 COMMERCE DRIVE	0.00	1.00	$744,932	$594
101	4	27	ARMSTRONG, CAROL W. TRUSTEE	8673 COMMERCE DRIVE	0.04	0.99	$459,232	$5,066
101	4	28	DENT, GEORGE E.	8685 COMMERCE DRIVE	0.36	1.00	$282,432	$31,355
101	4	29	MAUTZ, JOHN F. AND DIANA T/C	8695 COMMERCE DRIVE	0.03	1.00	$622,000	$6,259
101	142	4	HADDAWAY, PAUL V. AND JUANITA C.	318 SYCAMORE AVE	0.08	0.25	$109,176	$11,304
101	142	5	SPECTOR, BRIAN AND SHARY N.	506 HAZELWOOD DRIVE	0.06	0.23	$240,882	$17,622
101	142	12	COOPER, ROBERT A. AND GRACE H. L/E	507 HAZELWOOD DRIVE	0.02	0.17	$185,430	$5,515
101	142	13	EWING, DAVID A. AND TAMELA E.	509 HAZELWOOD DRIVE	0.05	0.17	$173,430	$14,860
101	142	14	SINGH, CYNTHIA A.	511 HAZELWOOD DRIVE	0.13	0.17	$178,992	$40,879
101	142	15	GIDDENS, GLADYS H.	513 HAZELWOOD DRIVE	0.01	0.17	$170,272	$1,780
101	142	16	SATTERFIELD, PAUL W. SR AND CHARLOTTE HOWETH	515 HAZELWOOD DRIVE	0.00	0.18	$207,290	$2,240
101	142	17	HALEY RENTALS, LLC	517 HAZELWOOD DRIVE	0.00	0.18	$198,820	$884
101	265	4A	LOWE'S HOME CENTER, INC.	501 GLEBE ROAD	0.01	14.58	$11,587,900	$4,970
101	3670	24	TRED AVON DEVELOPMENT LLC	8709 BROOKS DRIVE	0.06	0.91	$902,066	$21,266
101	3670	25	TRED AVON DEVELOPMENT LLC C/O LEE MAYER	BROOKS DRIVE	0.17	0.91	$674,932	$37,375
101	3670	26	S AND A LLC	8727 BROOKS DRIVE	0.06	0.91	$507,332	$10,354
101	3670	29	VAN SCHAIK, ROBERT AND TERESE V.S. SCHAUBER	BROOKS DRIVE	0.00	0.64	$580,832	$939
				Total	10.54	268.32		$633,888

LAND ACQUISITION - ALTERNATIVE 2								
MAP	PARCEL	LOT	OWNER	ADDRESS	ACRES OF OBSTRUCTIONS	TOTAL ACRES OF PARCEL	VALUE[$]	COST OF AVIGATION EASEMENT
25	13		JENSEN'S INC.	9632 HYDE PARK CT	0.10	94.02	$4,787,066	$1,461
25	16		C S TARBUTTON INC.	9541 OCEAN GATEWAY	0.08	0.88	$328,700	$8,798
25	19		OCEAN GATEWAY LLC	CENTREVILLE ROAD	0.19	0.72	$59,666	$4,632
25	46	8	TRINTAUDON, LLC	8977 MISTLETOE DRIVE	0.01	5.29	$899,732	$741
25	46	9A	SHAW FAMILY TRUST	BRYAN DRIVE	0.02	2.19	$286,000	$760
25	46	9B	OXFORD LAWN AND LANDSCAPE, INC.	9055 BRYAN DRIVE	0.37	2.06	$412,266	$22,019
25	48		RPM 50, LLC	9477 OCEAN GATEWAY	0.06	7.78	$710,800	$1,534
25	103		YI, KYOM AND YI, KYUNGWON T/C	9561 CORDOVA ROAD	0.12	1.55	$302,066	$6,974
25	138		TOWN OF EASTON	GOLDSBOROUGH NECK ROAD	5.65	86.25	$227,700	$4,473
25	147		TOWN OF EASTON	GOLDSBOROUGH NECK ROAD	0.09	3.10	$15,500	$133
25	207	13	A D & F RENTALS, INC. C/O ARTHUR FOSTER	9592 CORDOVA ROAD	0.01	0.46	$64,996	$165
25	219		DELMARVA REAL ESTATE MANAGEMENT GROUP LLC	9529 OCEAN GATEWAY	0.01	1.00	$214,710	$426
25	232	1	QUICK, JAMES A. AND MARY G.	9510 SERVICE LANE	0.03	0.48	$205,636	$4,417
25	238	3	WATERFOWL FESTIVAL, INC.	9210 CENTREVILLE ROAD	1.28	7.27	$271,566	$14,349
25	238	4	DELMARVA FOUNDATION FOR MEDICAL CARE, INC.	9240 CENTREVILLE ROAD	0.12	5.00	$2,610,566	$18,868
100	38		DELMARVA BANK DATA PROCESSING CENTER INC.	GLEBE PARK DRIVE	1.46	6.62	$1,739,900	$115,029
100	40		WHALEN COMPANY, INC.	8900 GLEBE ROAD	0.86	7.72	$3,889,300	$129,793
100	41		TOWN OF EASTON	840 GLEBE ROAD	0.65	6.84	$625,566	$11,853
101	4	1		GLEBE ROAD	0.07			
101	4	2	E AND H PROPERTIES, LLC	8694 COMMERCE DRIVE	0.27	1.00	$525,400	$42,515
101	4	3,4,5	DELAWARE COCA-COLA BOTTLING CO INC. C/O COCA COLA	321 COMMERCE DRIVE	0.45	5.09	$1,343,432	$35,757
101	4	10,11	POSTAL BUILDING LIMITED PARTNERSHIP	8632 COMMERCE DRIVE	0.06	2.26	$1,017,832	$7,580
101	4	12	COMMERCE PROPERTIES LLC C/O DAN RUEGG	8610 COMMERCE DRIVE	0.01	2.36	$1,117,332	$1,502
101	4	17	PIERSON, T. DOUGLAS AND DONNA M.	8582 COMMERCE DRIVE	0.20	2.77	$966,466	$21,350
101	4	24	HOCKER, HARRIET G. LIFE ESTATE	312 COMMERCE DRIVE	0.06	1.03	$177,566	$3,248
101	4	26	BUGG PROPERTIES LLC	8659 COMMERCE DRIVE	0.01	1.00	$744,932	$1,266
101	4	27	ARMSTRONG, CAROL W. TRUSTEE	8673 COMMERCE DRIVE	0.08	0.99	$459,232	$10,664
101	4	28	DENT, GEORGE E.	8685 COMMERCE DRIVE	0.39	1.00	$282,432	$33,355
101	4	29	MAUTZ, JOHN F. AND DIANA T/C	8695 COMMERCE DRIVE	0.05	1.00	$622,000	$9,346
101	142	4	HADDAWAY, PAUL V. AND JUANITA C.	318 SYCAMORE AVE	0.08	0.25	$109,176	$11,090
101	142	5	SPECTOR, BRIAN AND SHARY N.	506 HAZELWOOD DRIVE	0.06	0.23	$240,882	$17,841
101	142	12	COOPER, ROBERT A. AND GRACE H. L/E	507 HAZELWOOD DRIVE	0.01	0.17	$185,430	$2,842
101	142	13	EWING, DAVID A. AND TAMELA E.	509 HAZELWOOD DRIVE	0.05	0.17	$173,430	$14,018
101	142	14	SINGH, CYNTHIA A.	511 HAZELWOOD DRIVE	0.09	0.17	$178,992	$27,110
101	142	16	SATTERFIELD, PAUL W. SR AND CHARLOTTE HOWETH	515 HAZELWOOD DRIVE	0.01	0.18	$207,290	$1,111
101	265	4A	LOWE'S HOME CENTER, INC.	501 GLEBE ROAD	0.02	14.58	$11,587,900	$4,498
101	3670	20	KLEPPINGER, J. CHRISTOPHER, SR	8675 BROOKS DRIVE	0.01	0.91	$551,732	$1,369
101	3670	24	TRED AVON DEVELOPMENT LLC	8709 BROOKS DRIVE	0.24	0.91	$902,066	$70,771
101	3670	25	TRED AVON DEVELOPMENT LLC C/O LEE MAYER	BROOKS DRIVE	0.23	0.91	$674,932	$52,273
101	3670	26	S AND A LLC	8727 BROOKS DRIVE	0.10	0.91	$507,332	$17,364
101	3670	29	VAN SCHAIK, ROBERT AND TERESE V.S. SCHAUBER	BROOKS DRIVE	0.01	0.64	$580,832	$2,641
				Total	13.64	277.76		$741,933

LAND ACQUISITION - ALTERNATIVE 5								
MAP	PARCEL	LOT	OWNER	ADDRESS	ACRES OF OBSTRUCTIONS	TOTAL ACRES OF PARCEL	VALUE[$]	COST OF AVIGATION EASEMENT
25	13		JENSEN'S INC.	9632 HYDE PARK CT	0.01	94.02	$4,787,066	$1,815
25	16		C S TARBUTTON INC.	9541 OCEAN GATEWAY	0.07	0.88	$328,700	$7,810
25	19		OCEAN GATEWAY LLC	CENTREVILLE ROAD	0.47	0.72	$59,666	$4,555
25	46	8	TRINTAUDON, LLC	8977 MISTLETOE DRIVE	0.01	5.29	$899,732	$616
25	46	9A	SHAW FAMILY TRUST	BRYAN DRIVE	0.02	2.19	$286,000	$769
25	46	9B	OXFORD LAWN AND LANDSCAPE, INC.	9055 BRYAN DRIVE	0.37	2.06	$412,266	$22,192
25	48		RPM 50, LLC	9477 OCEAN GATEWAY	0.08	7.78	$710,800	$2,256
25	103		YI, KYOM AND YI, KYUNGWON T/C	9561 CORDOVA ROAD	0.12	1.55	$302,066	$6,737
25	138		TOWN OF EASTON	GOLDSBOROUGH NECK ROAD	5.75	86.25	$227,700	$4,552
25	147		TOWN OF EASTON	GOLDSBOROUGH NECK ROAD	0.09	3.10	$15,500	$133
25	207	13	A D & F RENTALS, INC. C/O ARTHUR FOSTER	9592 CORDOVA ROAD	0.01	0.46	$64,996	$149
25	219		DELMARVA REAL ESTATE MANAGEMENT GROUP LLC	9529 OCEAN GATEWAY	0.01	1.00	$214,710	$232
25	232	1	QUICK, JAMES A. AND MARY G.	9510 SERVICE LANE	0.04	0.48	$205,636	$4,624
25	238	3	WATERFOWL FESTIVAL, INC.	9210 CENTREVILLE ROAD	1.27	7.27	$271,566	$14,279
25	238	4	DELMARVA FOUNDATION FOR MEDICAL CARE, INC.	9240 CENTREVILLE ROAD	0.12	5.00	$2,610,566	$19,407
100	38		DELMARVA BANK DATA PROCESSING CENTER INC.	GLEBE PARK DRIVE	1.61	6.62	$1,739,900	$114,837
100	40		WHALEN COMPANY, INC.	8900 GLEBE ROAD	0.91	7.72	$3,889,300	$137,182
100	41		TOWN OF EASTON	840 GLEBE ROAD	0.64	6.84	$625,566	$17,668
101	4	1			0.09			
101	4	2	E AND H PROPERTIES, LLC	8694 COMMERCE DRIVE	0.30	1.00	$525,600	$46,595
101	4	3,4,5	DELAWARE COCA-COLA BOTTLING CO INC. C/O COCA COLA	321 COMMERCE DRIVE	0.55	5.09	$1,343,432	$43,789
101	4	10,11	POSTAL BUILDING LIMITED PARTNERSHIP	8632 COMMERCE DRIVE	0.05	2.26	$1,017,832	$6,213
101	4	12	COMMERCE PROPERTIES LLC C/O DAN RUEGG	8610 COMMERCE DRIVE	0.01	2.36	$1,117,332	$1,273
101	4	17	PIERSON, T. DOUGLAS AND DONNA M.	8582 COMMERCE DRIVE	0.03	2.77	$966,466	$2,778
101	4	24	HOCKER, HARRIET G. LIFE ESTATE	312 COMMERCE DRIVE	0.06	1.03	$177,566	$3,248
101	4	25	BAMBLING, JACQUES D.	314 COMMERCE DRIVE	0.01	1.00	$430,332	$172
101	4	26	BUGG PROPERTIES LLC	8659 COMMERCE DRIVE	0.02	1.00	$744,932	$3,390
101	4	27	ARMSTRONG, CAROL W. TRUSTEE	8673 COMMERCE DRIVE	0.11	0.99	$459,232	$14,992
101	4	28	DENT, GEORGE E.	8685 COMMERCE DRIVE	0.51	1.00	$282,432	$37,702
101	4	29	MAUTZ, JOHN F. AND DIANA T/C	8695 COMMERCE DRIVE	0.09	1.00	$622,000	$15,464
101	142	4	HADDAWAY, PAUL V. AND JUANITA C.	318 SYCAMORE AVE	0.08	0.25	$109,176	$10,892
101	142	5	SPECTOR, BRIAN AND SHARY N.	506 HAZELWOOD DRIVE	0.06	0.23	$240,882	$18,232
101	142	12	COOPER, ROBERT A. AND GRACE H. L/E	507 HAZELWOOD DRIVE	0.02	0.17	$185,430	$4,976
101	142	13	EWING, DAVID A. AND TAMELA E.	509 HAZELWOOD DRIVE	0.05	0.17	$173,430	$11,432
101	142	14	SINGH, CYNTHIA A.	511 HAZELWOOD DRIVE	0.16	0.17	$178,922	$39,338
101	142	15	GIDDENS, GLADYS H.	513 HAZELWOOD DRIVE	0.01	0.17	$170,272	$1,316
101	142	16	SATTERFIELD, PAUL W. SR AND CHARLOTTE HOWETH	515 HAZELWOOD DRIVE	0.01	0.18	$207,290	$1,111
101	265	4A	LOWE'S HOME CENTER, INC.	501 GLEBE ROAD	0.01	14.58	$11,587,900	$2,016
101	3670	20	KLEPPINGER, J. CHRISTOPHER, SR	8675 BROOKS DRIVE	0.01	0.91	$551,732	$1,338
101	3670	24	TRED AVON DEVELOPMENT LLC	8709 BROOKS DRIVE	0.24	0.91	$902,066	$71,175
101	3670	25	TRED AVON DEVELOPMENT LLC C/O LEE MAYER	BROOKS DRIVE	0.24	0.91	$674,932	$52,498
101	3670	26	S AND A LLC	8727 BROOKS DRIVE	0.10	0.91	$507,332	$17,386
101	3670	27	CLEM, WARREN D. AND CAROLE ANN	8737 BROOKS DRIVE	0.01	1.86	$1,374,066	$758
101	3670	29	VAN SCHAIK, ROBERT AND TERESE V.S. SCHAUBER	BROOKS DRIVE	0.03	0.64	$580,832	$7,418
				Total:	14.43	280.79		$775,181

SOURCE: Maryland Department of Assessments and Taxation, Real Property Data Search

[$]AS OF 07/01/2008

RPZ OBSTRUCTION TABLE - ALTERNATIVE 1, 2, and 5						
MAP	PARCEL	LOT	OWNER	ADDRESS	TOTAL ACRES OF PARCEL	VALUE[$]
25	18		NORRIS EASTON LAND COMPANY LLC	OCEAN GATEWAY	2.17	284,600
25	66		LOWE'S HOMES CENTER, INC ATTN TAX DEPT	LONGWOODS ROAD	24.46	2,630,666
101	263		EASTON CHURCH OF THE NAZARENE INC	GLEBE ROAD	1.03	113,386
25	46	1	PASTIME PROPERTIES, LLC	8801 MISTLETOE DRIVE	3.61	1,303,600
101	142	11	WILLEY, HAROLD LEROY AND NAOMI LANE	505 HAZELWOOD DRIVE	0.18	163,390
101	142	10	APPLE, JAMES E AND SHAREN L	503 HAZELWOOD DRIVE	0.24	202,906
101	142	9	BUSHE, ALIDA C	501 HAZELWOOD DRIVE	0.35	225,342
101	142	8	VAN EVERA, SEAN M AND GOLSHANI, AMBER M	500 HAZELWOOD DRIVE	0.18	186,922
25	58		EASTON EXCHANCE LLC	28712 GLEBE ROAD	58.19	5,631,332
101	264		MEARS PROPERTIES LLC C/O WALTER R. STONE	GLEBE ROAD	2.28	225,732
				Total:	92.69	10,967,876

SOURCE: Maryland Department of Assessments and Taxation, Real Property Data Search
[$]AS OF 07/01/2008

ON AIRPORT OBSTRUCTIONS - ALTERNATIVE 1, 2, AND 5							
MAP	PARCEL	LOT	OWNER	ADDRESS	ACRES OF OBSTRUCTIONS	TOTAL ACRES OF PARCEL	VALUE[$]
25	130		TALBOT COUNTY MARYLAND	29290 CLEARVIEW ROAD	0.17	0.24	65,900
25	132		TALBOT COUNTY MARYLAND	29304 CLEARVIEW ROAD	0.05	0.21	58,860
25	133		TALBOT COUNTY MARYLAND	29310 CLEARVIEW ROAD	0.00	0.15	47,360
25	134		LATHAM, R. JAMES	CLEARVIEW ROAD	0.01	0.24	2,500
25	135		TALBOT COUNTY MARYLAND	CLEARVIEW ROAD	0.09	0.21	55,846
25	136		TALBOT COUNTY MARYLAND	CLEARVIEW ROAD	0.10	0.31	68,840
				Total:	0.42	1.36	299,306

SOURCE: Maryland Department of Assessments and Taxation, Real Property Data Search

[$]AS OF 07/01/2008

APPENDIX C: DETAILED DEVELOPMENT COSTS

Appendix C - Detailed Development Costs

Development Costs Alternative 2	
Mobilization / Demobilization / Construction Layout and Surveying	375,000.00
Temporary Construction Items	375,000.00
Site Demolition	95,000.00
Site Work	400,000.00
Earthwork	360,000.00
Paving	2,450,000.00
Signage and Markings	74,500.00
Service Road (Paved)	150,000.00
Erosion and Sediment Control	80,000.00
Stormwater Management and Drainage (Potential Major Structure)	400,000.00
Electrical Demolition	50,000.00
Edge Lighting	1,246,575.00
Temporary Electrical	30,000.00
Electrical Sitework	650,000.00
Vault Work	50,000.00
SUBTOTAL :	***6,427,699.00***
CONCEPTUAL PLANNING PHASE MARKUP (25%) :	***1,606,925.00***
TOTAL ESTIMATED CONSTRUCTION COST :	***$ 8,034,624.00***

Appendix C - Detailed Development Costs
Site Demolition

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 95,000.00 / 10/13/2008
X-67-2.6	DEMOLISH FENCE/GATE	LF	2.50	340.00	850.00
P-151-5.1	CLEARING AND GRUBBING	AC	5,400.00	0.90	4,860.00
Z-1-4.1	PROPERTY DEMOLITION	LS	13,250.00	1.99	26,390.00
Z-1-4.2	PROPERTY DEMOLITION	LS	4,000.00	2.00	8,000.00
Z-1-4.3	BUILDING DEMOLITION	LS	9,800.00	2.00	19,600.00
Z-1-4.4	BUILDING DEMOLITION	LS	8,650.00	2.00	17,300.00
Z-1-4.5	CONTINGENCY - UNKNOWN MATERIALS	SF	6.00	1,500.00	9,000.00
Z-1-4.6	CONTINGENCY - UNKNOWN MATERIALS	SF	6.00	1,500.00	9,000.00

Appendix C - Detailed Development Costs

Site Work

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 400,000.00 / 10/13/2008
F-162-5.1	10' CHAIN LINK FENCE WITH 3 STRANDS BARBED WIRE	LF	19.00	7,754.47	147,335.00
F-162-5.2	22-FOOT WIDE, DOUBLE SWING VEHICULAR GATE	EA	1,825.00	3.00	5,475.00
T-901-5.1	HYDROSEEDING	AC	1,500.00	26.00	39,000.00
T-904-5.1	SODDING	SY	5.00	16,600.00	83,000.00
T-905-5.1	TOPSOILING	AC	4,815.00	26.00	125,190.00

Appendix C - Detailed Development Costs

Paving

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 2,450,000.00 / 10/13/2008
X-25-5.2	VARIABLE DEPTH BITUMINOUS CONCRETE MILLING (2 INCH MAX. DEPTH)	SY	2.00	790.00	1,580.00
X-27-5.1	PAVEMENT GROOVING	SY	1.10	30,450.00	33,495.00
X-31-5.1	FILTER FABRIC	SY	1.85	78,600.00	145,410.00
P-209-5.1	CRUSHED AGGREGATE BASE COURSE	CY	33.75	19,000.00	641,250.00
P-401-8.1	BITUMINOUS SURFACE COURSE - AIRCRAFT	TON	65.00	10,600.00	689,000.00
P-401-8.2	BITUMINOUS BASE COURSE - AIRCRAFT	TON	59.00	14,521.44	856,765.00
P-603-5.1	BITUMINOUS TACK COAT	GAL	2.45	10,000.00	24,500.00
D-705-5.1	4-INCH, HDPE UNDERDRAIN (PERFORATED), COMPLETE	LF	8.80	4,500.00	39,600.00
D-705-5.2	4-INCH, HDPE UNDERDRAIN (SOLID), COMPLETE	LF	8.00	400.00	3,200.00
D-705-5.3	UNDERDRAIN CLEANOUT	EA	980.00	10.00	9,800.00
D-705-5.4	UNDERDRAIN OUTLET (MDSHA 387.01)	EA	540.00	10.00	5,400.00

Appendix C - Detailed Development Costs
Signage and Markings

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 75,000.00 / 10/13/2008
P-620-5.1	TEMPORARY PAVEMENT MARKING	SF	0.38	34,000.00	12,920.00
P-620-5.2	PERMANENT PAVEMENT MARKING	SF	0.43	34,000.00	14,620.00
L-125-5.9	L-858R GUIDANCE SIGN, COMPLETE	EA	3,300.00	9.00	29,700.00
L-125-5.10	L-858Y TAXIWAY RETROREFLECTIVE SIGN, COMPLETE	EA	2,000.00	8.88	17,760.00

Appendix C - Detailed Development Costs
Service Road

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 150,000.00 / 10/13/2008
MD-504-1.1	BITUMINOUS CONCRETE - SURFACE COURSE, NON-AIRCRAFT	TON	64.00	1,296.88	83,000.00
MD-504-1.2	BITUMINOUS CONCRETE - BASE COURSE, NON-AIRCRAFT	TON	59.00	1,000.00	59,000.00
MD-901-1.1	CRUSHED AGGREGATE PAVEMENT	SY	8.00	1,000.00	8,000.00

Appendix C - Detailed Development Costs
Erosion and Sediment Control

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 80,000.00 / 10/13/2008
P-156-5.1	SILT FENCE	LF	2.60	12,300.00	31,980.00
P-156-5.2	TEMPORARY EROSION CONTROL MATTING	SY	2.00	5,950.00	11,900.00
P-156-5.3	TYPE A EARTH DIKE	LF	5.00	1,224.00	6,120.00
P-156-5.4	TEMPORARY STONE OUTLET STRUCTURE	EA	525.00	5.00	2,625.00
P-156-5.6	TEMPORARY STONE CHECK DAM	EA	194.00	20.00	3,880.00
P-156-5.7	ROCK OUTLET PROTECTION - III	SY	31.00	80.97	2,510.00
P-156-5.8	MODIFIED CHECK DAM	EA	194.00	8.00	1,552.00
P-156-5.9	STONE OUTLET SEDIMENT TRAP (ST-IV)	EA	593.00	1.00	593.00
P-156-5.10	SUPER SILT FENCE	LF	23.00	100.00	2,300.00
P-156-5.11	STABILIZED CONSTRUCTION ENTRANCE, COMPLETE	EA	1,725.00	4.00	6,900.00
P-156-5.12	TEMPORARY DRAWDOWN DEVICE	EA	1,620.00	2.54	4,120.00
P-156-5.13	STANDARD INLET PROTECTION	EA	350.00	4.00	1,400.00
P-156-5.14	TEMPORARY DRAWDOWN DEVICE	EA	1,617.00	2.55	4,120.00

Appendix C - Detailed Development Costs
Stormwater Management

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 400,000.00 / 10/13/2008
P-156-5.5	RIP-RAP INFLOW PROTECTION	SY	30.00	135.00	4,050.00
D-701-5.1	15-INCH RCP, CLASS IV	LF	52.00	482.69	25,100.00
D-701-5.2	18-INCH RCP, CLASS IV	LF	55.00	448.00	24,640.00
D-701-5.3	24-INCH RCP, CLASS IV	LF	70.00	184.00	12,880.00
D-751-5.5	15-INCH STANDARD MDSHA END SECTION (MDSHA-368.01)	EA	555.00	6.00	3,330.00
D-751-5.6	18-INCH STANDARD MDSHA END SECTION (MDSHA-368.01)	EA	660.00	4.00	2,640.00
D-751-5.7	24-INCH STANDARD MDSHA END SECTION (MDSHA-368.01)	EA	840.00	4.00	3,360.00
D-751-5.8	CONTINGENCY - UNKNOWN DRAINAGE STRUCTURE	LS	18,825.00	17.21	324,000.00

Appendix C - Detailed Development Costs
Electrical - Edge Lighting

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 1,015,000.00 / 10/13/2008
L-108-5.1	UNDERGROUND CABLE, NO. 8 AWG, 5kV CABLE, L-824 INSTALLED IN DUCT OR TRENCH	LF	2.70	35,518.52	95,900.00
L-108-5.2	NO.6 BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, INCLUDING GROUND RODS AND GROUND CONNECTIONS	LF	2.00	39,800.00	79,600.00
L-108-5.11	UNDERGROUND CABLE, NO. 8 AWG, 600V, RHH/RHW/USE-2, INSTALLED IN DUCT	LF	5.00	5,000.00	25,000.00
L-108-5.12	UNDERGROUND CABLE, NO. 10 AWG, 600V, RHH/RHW/USE-2, INSTALLED IN DUCT	LF	4.00	6,300.00	25,200.00
L-108-5.13	UNDERGROUND CABLE, 1-3/C NO. 8 AWG, 600V, TYPE MC, INSTALLED IN DUCT OR TRENCH	LF	8.00	1,900.00	15,200.00
L-108-5.14	UNDERGROUND CABLE, 1-3/C NO. 6 AWG, 600V, TYPE MC, INSTALLED IN DUCT OR TRENCH	LF	9.00	2,600.00	23,400.00
L-108-5.15	UNDERGROUND CABLE, 25 PAIR #19 – PE39 CABLE INSTALLED IN DUCT OR CONDUIT	LF	10.00	350.00	3,500.00
L-125-5.1	STAKE MOUNTED L-861 RUNWAY EDGE LIGHT, COMPLETE	EA	2,400.00	37.00	88,800.00
L-125-5.2	BASE MOUNTED L-861 RUNWAY EDGE LIGHT, COMPLETE	EA	4,000.00	10.00	40,000.00
L-125-5.3	STAKE MOUNTED L-861 THRESHOLD LIGHT, COMPLETE	EA	2,300.00	8.00	18,400.00
L-125-5.4	BASE MOUNTED L-861 THRESHOLD LIGHT, COMPLETE	EA	4,000.00	4.00	16,000.00
L-125-5.5	STAKE MOUNTED L-861 TAXIWAY EDGE LIGHT, COMPLETE	EA	2,250.00	192.00	432,000.00
L-125-5.6	BASE MOUNTED L-861 TAXIWAY EDGE LIGHT, COMPLETE	EA	4,000.00	38.00	152,000.00

Appendix C - Detailed Development Costs
Eletrical - Sitework

Pay Item	SUBTOTAL: / DATE:	Unit	Unit Cost	Bid QTY	$ 650,000.00 / 10/13/2008
L-108-5.3	CABLE TRENCH	LF	3.00	28,300.00	84,900.00
L-108-5.4	CABLE AND DUCT MARKER	EA	1,200.00	14.00	16,800.00
L-110-5.1	ONE-WAY 2-INCH SAND ENCASED DUCT BANK	LF	10.00	475.00	4,750.00
L-110-5.2	ONE-WAY 2-INCH CONCRETE ENCASED DUCT BANK	LF	12.00	440.00	5,280.00
L-110-5.3	TWO-WAY 2-INCH CONCRETE ENCASED DUCT BANK	LF	21.00	355.00	7,455.00
L-110-5.4	THREE-WAY 2-INCH SAND ENCASED DUCT BANK	LF	46.00	70.00	3,220.00
L-110-5.5	FOUR-WAY 2-INCH SAND ENCASED DUCT BANK	LF	48.00	90.00	4,320.00
L-110-5.6	FOUR-WAY 2-INCH CONCRETE ENCASED DUCT BANK	LF	70.00	40.00	2,800.00
L-110-5.7	ONE-WAY 3-INCH CONCRETE ENCASED DUCT BANK	LF	38.00	130.00	4,940.00
L-110-5.8	TWO-WAY 3-INCH SAND ENCASED DUCTBANK	LF	23.00	670.00	15,410.00
L-110-5.9	TWO-WAY 3-INCH CONCRETE ENCASED DUCT BANK	LF	23.00	710.00	16,330.00
L-110-5.10	THREE-WAY 3-INCH SAND ENCASED DUCT BANK	LF	31.00	2,100.00	65,100.00
L-110-5.11	THREE-WAY 3-INCH CONCRETE ENCASED DUCT BANK	LF	31.00	1,320.00	40,920.00
L-110-5.12	FOUR-WAY 3-INCH SAND ENCASED DUCT BANK	LF	42.00	630.00	26,460.00
L-110-5.13	FOUR-WAY 3-INCH CONCRETE ENCASED DUCT BANK	LF	42.00	670.00	28,140.00
L-110-5.14	SIX-WAY 3-INCH CONCRETE ENCASED DUCT BANK	LF	68.00	420.00	28,560.00
L-110-5.15	EIGHT-WAY 3-INCH CONCRETE ENCASED DUCTBANK	LF	140.00	25.00	3,500.00
L-110-5.16	TWO-WAY 4-INCH SAND ENCASED DUCTBANK	LF	29.00	260.00	7,540.00
L-115-5.1	ELECTRICAL MANHOLE, 4-FT X 4-FT X 6-FT, AASHTO-HS-25	EA	9,000.00	2.00	18,000.00
L-115-5.2	ELECTRICAL HAND HOLE, 3-FT X 3-FT X 3-FT, AASHTO-HS-25	EA	7,000.00	22.50	157,475.00
L-115-5.3	ELECTRICAL JUNCTION BOX, 18-INCH DIA, AASHTO-HS-25	EA	1,900.00	10.00	19,000.00
L-125-5.11	AREA LIGHTING FIXTURE - SINGLE ARM	EA	7,300.00	8.00	58,400.00
L-125-5.12	AREA LIGHTING FIXTURE - DOUBLE ARM	EA	8,900.00	3.00	26,700.00
L-125-5.14	L-867 BASE WITH STEEL COVER	EA	800.00	5.00	4,000.00